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ON THE COUP DE SOLEIL. By JAMES MITCHELL, Esq. Surgeon, Royal Navy.

This disease has been termed by the French "*Coup de Soleil*," or stroke of the sun, thereby expressing the chief cause of its formation. Cullen seems to consider it as a symptomatic species of phrenitis, and terms it "*Phrenitis Calentura*" in his *System of Nosology*, although I do not observe that he takes notice of it in his work on the *Practice of Physic*, except that he enumerates among the causes of phrenitis, exposure of the naked head to the sun's rays. Dr. Thomas, in his *Practice of Physic*, speaks of this disease as a species of apoplexy. Certainly, in some cases, the stroke of the sun produces apoplexy, or something very much resembling it; and when the system does recover from the stroke, it is not to be distinguished from apoplexy, either when life remains, or afterwards by dissection, the appearances being the same. But, in general, it seems after the stroke to assume the character of phrenitis; and, in my opinion, Dr. Cullen more properly classes the disease as a species of phrenitis in class *Pyrexia*, order *Phlegmasia*. I therefore think the name of *Ictus Solis*, or *Coup de Soleil* of the French, is the most expressive term for it, as it comprises its apoplectic as well as its phrenitic character.

The effects of the stroke of the sun were not unknown to the ancients in warm climates; hence we find in the Sacred Writings allusions to the effects of the sun producing severe disease, and sudden death.

I may adduce the following passages respecting the knowledge of the sacred writers respecting the influence of the sun on the human frame. Psalms, cxxi. v. 6, "The sun shall not smite thee by day, nor the moon* by

night." Isaiah, chap. xlix. v. 16, "They shall not hunger nor thirst, neither shall the heat nor sun smite them, for he that hath mercy on them shall lead them, even by the springs of water shall he guide them." Jonah, chap. iv. v. 8, "And it came to pass when the sun did arise, that God prepared a vehement east-wind; and the sun beat upon the head of Jonah, that he fainted, and wished in himself to die, and said it is better for me to die than to live."

Various other passages might be adduced to prove the effects of the sun on the human frame, and the blessings of shade in foreign countries. But these may suffice.

Coup de Soleil or sun stroke is known to occur in all hot climates, particularly in their hot seasons. When surgeon of the naval establishment of Canada, Lake Champlain, in the summer of 1815, I had a great number of cases, with one exception all marines, and all of which occurred in the course of two very hot sunny days. They were attacked with it at their posts with their muskets in their hands; and such was the fury with which they were seiz-

in the full moon, their mouths being drawn awry, and never regaining their usual appearance. Once, when at Java, a sailor was under my care for intermittent fever, apparently produced from sleeping on deck in the moon, attended with very anomalous symptoms, such as sudden swelling of the face, delirium, livid spots on the face and countenance, appearing and disappearing at irregular intervals, and a paralytic affection of the mouth and tongue. The people and himself attributed it all (on my inquiries) to his sleeping in the moon; but I judged it rather to arise from his exposure to the concentrated marsh miasma which abounds in the night-time, and is so fatal to Europeans in that climate, though I would not go the length with most of my brother surgeons in his Majesty's service, who have treated the notion of the moon as ridiculous, and merely to have originated in the superstitions of the sailors. The moon has certainly some influence as well as the sun in producing or modifying diseases. It is very clear, that fish or meat exposed in warm climates to the rays of the moon, not only turns putrid, but are in some cases rendered poisonous.

* David, in the Psalm above alluded to, mentions the stroke of the moon as well as of the sun. Now, this is an allusion to a most singular effect of the moon, although it cannot be from the heat it emits. However, as David says, it does produce a stroke of some kind. I have heard of its producing paralysis of the faces of sailors when exposed sleeping on deck

ed that they actually made a charge. I have observed three kinds of this disease:—1st, Sudden and complete insensibility, attended with total loss of power, stupor, and stertorous breathing.—This is the apoplectic species. 2d, The immediate appearance of symptoms of violent phrenitis with delirium. The 3d, consisting of symptoms of chronic phrenitis, coming on gradually, and continuing a long time, attended by delirium of a particular nature; sometimes violent when the patient was treated kindly, but in general being attended with a perversion of ideas.

The 1st species, which I have termed the apoplectic, is a very fatal disease. It generally occurs in persons of full habit, living freely, and suffering much from heat; in consequence of being ordered on some arduous service (when the stomach is distended with food, and the blood-vessels excited by ardent spirits,) under a burning sun; or after exposing the body to the sun in the act of sleeping after a drunken fit, as I have seen sailors do.

In these cases the pupils are remarkably dilated, the patient insensible to external stimuli; the features of the countenance distorted and distended, seemingly as if there was engorgement of all the vessels; the pulse slow and labouring, sometimes intermitting; the veins of the neck and head of the subcutaneous order seem frightfully engorged; and, indeed, such is the determination to the head, that the skin of these parts seems as if it had undergone a most successful injection, or was in a high state of inflammation. Sometimes paralysis of the sphincters takes place; all sensibility is gone; and the patient lies in whatever posture he is placed. The extremities are generally cold; and if something is not instantaneously done death soon closes the scene.

A sailor, when on shore, had drank a great deal of ardent spirits. After this, on leaving the canteen, he went to a retired place in the open air, lay down to sleep, exposed to the rays of a vertical sun, and he was found out by accident shortly afterwards in an insensible state, not from the influence of spirits, but from the effects of the sun on him in that state of debility from sleep and spirits. The mess-mates thought him drunk, and had him put to bed as such. On my arrival, about twelve hours afterwards, he was reported to me as in that state; but having some suspicion about the case, I examined him, and found him to be labouring under the above-mentioned disease. He was taken to the hospital, where, by the exertion of very powerful means, I gradually restored him, though it was a month before he was fit for duty.

I confess it is very difficult to distinguish in some cases of this nature, whether apoplexy has taken place, or whether the patient is merely labouring under the operation of intoxicating liquors. It is requisite to understand the diagnosis accurately, to determine the proper mode of treatment, as what is absolutely necessary in the one case might prove fatal in the other. Since writing the above, various

cases of this species of the stroke of the sun have occurred in England this summer, in consequence of the great heat, generally attacking labouring people in the fields engaged in agriculture, and almost in every case proving quickly fatal. In one newspaper I observed no fewer than twelve cases of sudden death from this disease.

In this state the vessels of the brain become turgid; and, by being once distended, they cease to circulate the blood, and thereby produce alarming compression of the brain, generally becoming speedily fatal by the rupture of a considerable blood-vessel, or more slowly, by a small blood-vessel giving way, or by effusion of serum; and before the system rallies sufficiently to absorb the effused fluid, a fatal termination ensues.

In this species of the disease every thing depends on the most speedy and energetic treatment; for if something is not done instantly when the patient is seized, it is very unlikely that any future treatment will be of use. The treatment I have found to be most efficacious is the following: 1st, A very large general bleeding, so as to produce complete relaxation of the system, either from a vein of the arm, from the temporal artery, or what is much more efficacious, viz. from the external jugular vein, which seemed to me to act more decidedly in withdrawing the blood from the vessels of the head, and thereby relieving them from that dreadful engorgement which proves fatal either by a rupture of some of them, or from effusion being produced. 2d, The head to be shaved, and cold fluids to be poured on its centre from a height. 3d, The lower extremities to be placed in very hot water. 4th, Stimulating purgative enemata to be thrown up the *rectum*. 5th, The whole body to be rubbed with stimulating embrocations. If these means are so far successful in preventing a fatal termination, the necessary after treatment is the same as will be required for the other species to be taken notice of afterwards. Could a medical man be found immediately, and these means used, I think this species of the disease would not prove so rapidly and generally fatal as it does. On one occasion, when having landed on an island in Jarvis's Straits, which was hardly any thing but a naked rock, and that nearly white from the dung of sea-birds, I suffered much from the reflection of a burning sun, and indeed thought I was on the point of having a stroke of the sun, as I nearly lost my vision, and my head felt distended as if ready to burst. I rushed towards a cave in the rock facing the sea, and finding salt water in it, I took a handkerchief, and with it kept my head in a constant state of evaporation. In fifteen minutes I felt myself completely relieved from the most unpleasant sensations. When my companions joined me, they were all suffering much from the intense heat, though by no means in the proportion that I did, as their habits were not equally plethoric. They followed the plan that I had adopted, and soon experienced relief.

The second species, which I term Phrenitic Acute, bears a very strong resemblance to phrenitis in its symptoms, except that it occurs in an instant without previous warning. I think that it cannot be better described both in its history, symptoms, causes, and treatment, than as it appeared to me on service in Canada, during a very hot summer, about ten years ago.

I was stationed as surgeon to a naval establishment on an island in Canada, near one of its celebrated lakes. The island was quite free from trees or shelter. The sun beat freely on every part of it, and was very oppressive in summer; but in the particular season alluded to, the heat of the sun was so excessive, that in Montreal horses dropt down dead in the streets, and the bee-hives discharged their precious contents. Our marines on sentry were ordered to keep their boxes for shelter, having little windows of observation cut in them. But such is the carelessness of these men, with regard to the preservation of their persons, that several of them scorned the advice, and walked about, and thereby to the number of seventeen or thereabouts, suffered this species of the stroke of the sun. They in an instant became quite deranged, charged with their muskets, pushing at every thing they met with in their route, till they were seized by force, and conveyed to the hospital. On inspecting them, I found great muscular strength exhibited, continual struggling to get free from the necessary restraint put on them; the muscles and all the blood-vessels much distended; eyes red, protuberant, and staring, pupil contracted; face swelled, red, and all the features distorted; the neck turgid and red; jugular veins much enlarged, the carotids pulsating with great violence, so as to be seen elevating the surrounding integuments. All these cases occurred in the space of a day or two.

As I dreaded from the violence of the symptoms effusion of blood or serum, I immediately determined on a large general bleeding from the arm, *usque ad deliquium animi*. From the first case, which was a very violent one, as the man was of a very plethoric habit, it was requisite to take away about five pounds of blood by measure before I could induce fainting, and consequent cessation of the violent vascular and muscular action. The relaxation of the system was then so great, the sphincters becoming powerless, and syncope was so complete, that I thought I had carried my plan too far. The system soon rallied, however; and, in four or five hours more, the symptoms returned, though not with their former violence, and I was under the necessity of abstracting two pounds more. In none of the cases did I abstract less than three pounds the first time, and less than five pounds at the two general bleedings, not being under the necessity of repeating them more than twice, as they had the most happy effect. The only other remedies necessary were shaving the head and keeping the surface in a continual state of evaporation by cloths wet with vinegar and water;

exhibiting purgatives and enemas, with cooling acidulous drinks. They all recovered, though the cure was tedious, owing to the great debility ensuing after such increased action, and consequent extreme depletion.

After this several persons in the vicinity were attacked with the same disease. At first they were treated by small and frequent topical bleedings; but two died under the treatment; and on dissection effusion of blood was found in one case,* and of serum in another, which was more protracted; therefore, larger bleedings were had recourse to, and this proved successful. The bleedings were not to the extent of mine, as they were not able to bear so much loss of blood as the sailor, from the latter being more plethoric, owing to his confined life, and having a more full diet, and more spirituous liquors. I do not mean to say that I would take so much blood perhaps in this country were similar cases to occur, (and I am persuaded they often take place in hot summers;) but my great object would be if possible on all occasions to produce a complete state of syncope. I met with two cases of this disease at Rio de Janeiro about four years ago, and I carried the depleting system to as great an extent, and with the happiest success, though they were both men of spare, and by no means of plethoric habits.

The third species I call Phrenitic Chronic, because it comes on rather gradually and insidiously, and may continue a long time without destroying the powers of life. It seems from the cases I have seen, to have during its continuance a tendency to disorder the arrangement and association of ideas rather than to destroy vitality; and though I have not been able in my limited knowledge of this disease to find out that it ever terminated in permanent mania, yet I have no doubt it contributes its proportion to the formation of that disease, particularly when persons are obliged to remain in a hot climate, where it is chiefly engendered. In all the cases I have known the patients were ordered to England to enjoy the bracing air of its climate; and their ideas never became correct till they got out of the hot into cooler latitudes, when they awoke as it were out of a dream, and wondered how they had remained in such a delusion and train of reasoning and ideas so foreign to them.

As far as my experience goes, I have observed this disease only in hot climates. The patients were persons in a superior sphere of life, who had been well educated, men of very acute feelings, particularly in all points of their duty as officers; for I have known none of the lower orders afflicted with the malady.†

* Chisholm in his Manual mentions that in fatal cases of sun-stroke in the West Indies, it was not uncommon to find blood effused in the ventricles of the brain.—En.

† Officers, both military and medical, are most frequently affected with this species, when, in the discharge of their duty, they are exposed to the sun's rays, where the heat is not

The disease began by the person suffering a dull headach for some days, and considerable feeling of distention of the head, as if the brain was confined by the skull, and unable to expand itself. The countenance was turgid, sometimes flushed and pale alternately; many vessels were seen on the conjunctiva carrying red blood; pulse quick and noisy; tongue much loaded in the centre, with a red edge; rather dry in that part. The patient's mind is at the same time much agitated, particularly about his official business; every trifling joke is converted into a serious insult; and he is very irascible, particularly towards those who are his best friends. He seems to be continually engaged in a bustle; his mind is so incessantly occupied that he cannot sleep, nor will he take time to eat his food, if placed before him. He swallows it as it were unconsciously, without chewing it, talking all the time, loquacity being a prominent feature of the complaint, the language good and the reasoning excellent. He engrosses the whole of the conversation, and directs it to himself, his situation, and affairs; but he speaks loud and dictatorially, without his usual prudence, and seeming in no wise to care whether he offends or not, considering his situation desperate. Every contradiction throws him into a perfect paroxysm of passion and violence. At this time, on particular observation, there will be found a tumefaction of the right side in the hypochondriac region, though without pain on pressure. This seems to arise from engorgement of the liver from bile, as little or none passes with the stools; and indeed, as may be supposed, great costiveness is prevalent; the stools are hard, and of a light clay-colour; and the urine is very scanty, and much loaded. There is no jaundiced appearance prevalent. This alarming state of the frame is not observed by the patient himself. He thinks his health is unimpaired; that he is merely oppressed with multifarious duties; and that as soon as they are finished every thing will go on as usual. In this state he may proceed perhaps for weeks, sleeping and eating little or almost none, merely drinking a great quantity of fluid on account of the great and incessant thirst existing from the intense febrile action that prevails. At this time the skin is quite arid, and perspiration not visible, though the heat of the weather is great. The strength of the body is not diminished, but, on the contrary, much increased, and the patient goes about, and is able to make very great exertions.

Previous to these symptoms the patient had been harassed by various arduous duties and heavy responsibilities, and required to make great exertions, when exposed to the rays of a tropical sun, sometimes in boats, at other times on horseback, and often marching to great distances, with feelings much goaded, perhaps on account of his not being able to accomplish

so excessive as to produce the former species. We have seen examples from the East Indies and Sicily.—*Ed.*

the service upon which he was sent, in spite of every exertion of his own, to the risk even of losing health or life, while others who should have assisted him were unable or unwilling to afford the expected co-operation. Under these circumstances, with the mind anxious and the body exhausted, it cannot be wondered at that a tropical sun should have such effects on those who had previously stood its powerful rays with impunity.

If at this stage of the complaint the patient is not attended by a skilful physician, the event must be lamentable indeed; things will go on from bad to worse. The practitioner should proceed in the case with the greatest gentleness and caution. It will require all the address of the most consummate politician to get the patient to receive visits and to take medicines, as it is difficult to convince him that there is a necessity for either the one or the other. He requires to be courted and won by the most soft and soothing language of persuasion and friendship. His physician must reason with him calmly on the heat of the weather, impress the consequent necessity of keeping within doors, cool and quiet, and the propriety of removing the bile by purgatives, a caution which is known to be necessary by all persons, not medical men only, who frequent hot climates. His diet should be very mild, cooling, and laxative. All stimuli, either in the way of food, clothing, or mental excitement, should be most studiously avoided. By this plan in the course of a short time it may be completely removed.

But, on the contrary, should a different plan be pursued, such as the use of restraint or violence, and plainly pointing out to the patient that you consider him insane, the disease is greatly aggravated. The eyes become red and ferrety; the countenance more flushed; and there are evident symptoms of determination to the head. He then grows jealous of every one, and suspects and dislikes his best friends, as he is well aware, that, though their intentions are good, they are taking means to secure him, and he is therefore continually on his guard respecting all their advices and proposals towards him. Should they succeed in securing him he becomes perfectly frantic; and the most violent measures in the way of depletion are then had recourse to, in order to remove the disease. Improvement, however, does not take place until all restraint is removed, and perfect confidence is restored between the patient and physician.

I do not mean to say that restraint in this species always brings on the maniacal attack, or that it would have not occurred spontaneously. But in one case that came under my own observation, it was decidedly brought on by ill-timed and ill-judged measures. When this state is induced, the delirium is chiefly monomaniacal. The person is perfectly aware of the presence of his friends and acquaintances when they visit him; able to answer readily, and with very great shrewdness, any question which is put. The answer is rational, un-

less when they touch on subjects connected with his particular hallucination. He reasons very logically, and with great acumen on all subjects introduced, though there be great volubility of tongue, anxiety of the countenance, and extraordinary opinions are advanced, with a large proportion of the ludicrous in all his remarks. During the whole of this state the bowels are so much constipated, that ordinary purgatives have little or no effect. The secreting function of the liver seems to be decidedly deranged, indicated by evident swelling in the hypochondriac region, and also by the stools being perfectly white and destitute of bile. The appetite is entirely gone; the thirst is trifling; the skin quite dry and dingy, of an anserine appearance; and indeed the body throughout puts on rather a jaundiced hue.

Even under the very best treatment the delirious train of ideas does not subside for a very long time; and the patient betrays such a degree of eccentricity, both in words and actions, that it appears doubtful whether he will ever be restored to his former state of sound feelings. In none of the instances I saw were ever the delirious feelings removed, till the individuals had left the warm climate and got into a colder one; when they looked back with amazement and alarm, on their former ideas on subjects in which they were now perfectly lucid. The disease, indeed, and the remedies generally used for its removal, completely destroy the tone of the nervous system.

Should the disease from neglect or bad treatment terminate in maniacal delirium, the usual plan that is had recourse to is large bleedings, both general and local; severe purging; blistering; cold baths, and almost total abstinence from food. At the same time, violent coercion is employed. The result of all this is in general a complete loss of tone in the nervous system, death, or confirmed insanity. As such are the dismal effects of this treatment, it is necessary some other plan should be adopted. I consider this disease to be chronic phrenitis, produced by a relaxation, and consequent fullness of the vessels of the membranes of the brain; but particularly of the delicate arachnoid coat, arising from loss of equilibrium between the circulating and nervous systems, evidently the product of debility. Whatever tends to recover the tone of these vessels and the balance lost between the circulating and nervous power must remove the disease, unless there be some organic change existing in these parts. These inferences are justified by the appearances on dissection of persons who died while labouring under this disease.

In this stage of the disease there is neither headach nor intolerance of light to indicate acute inflammation of the cerebral membranes. On the contrary, there seems to be a temporary paralytic state of the nerves of these parts, and hence an inability to propel the blood, producing stagnation, and consequent distention of the vessels. I cannot agree with Pinel and Esquirol, who suppose in this state of disease that the digestive organs are the first in

fault. In the cases which I have observed, and I have done it very narrowly, the brain and nervous system were first affected, and through them the circulating and digestive organs became deranged. The system of indiscriminate bleeding in all head cases, and to a great extent, has done an immensity of harm. Serous effusion has been induced, and the event which the medical man dreaded was hastened by the step he took. It certainly requires attentive examination into the history of the patient, into his previous habits and former complaints, to ascertain when bleeding is necessary in these cases. The young and inexperienced practitioner, when he gets a case of inflammation of the brain, or other viscus under his care, thinks he can never do wrong if he bleeds till pain ceases, and all symptoms of inflammation are gone. But how many has this practice sent to their graves; and hence the great necessity of careful observation, to trace the line of demarcation between the acute and chronic stage of the inflammation. The moment that the chronic state is observed, a very different plan of proceeding is necessary; and though the necessary quantity of blood should be drawn, the patient should lose no more; for it is astonishing what injury is done by any undue quantity of blood taken away, after the acute state is removed; viz. in phrenitis, producing effusion between the membranes, and in the ventricles of the brain; in carditis, causing hydropericardii; in pneumonia, inducing hydrothorax or phthisis; in gastritis, leaving great sinking of the vital powers; in peritonitis, causing ascites; in enteritis tympanites; and in rheumatic fever, a complete break down of the constitution. All this appears to me to occur from the balance being destroyed between the circulating and nervous systems, and by the waste of that electric nervous fluid, which gives tone to the animal fibre.

The treatment I would recommend for this state of the disease, when the maniacal state has come on, would be gentle purging with aloes and canella, assisted by enemata, draughts composed of the acetate of morphia, camphor, and antimony, in large doses, aided by the warm salt-water shower-bath, (taking care to rub the body well with coarse cloths, and then place it in blankets,) so as to allay nervous irritation, induce sleep, and promote determination to the surface. General bleeding should be most sedulously avoided; and if depletion be required at all, it should be done by the aid of leeches to the temples. The head should be shaved, and kept cool by cloths wetted with vinegar and water. A blister may be applied between the shoulders, or, what is much better, a seton may be placed in the nape of the neck. If it appear that the disease is complicated with any hepatic affection, indicated by a puffy swelling in that region, with pain on pressure, and the other usual symptoms, then a cluster of leeches should be applied to the pained part, followed up by a large poultice, giving internally some brisk purgatives of calomel and jalap. Nourishing food, with

malt liquor, should be given, and great attention paid to cleanliness.

The nurse who attends must be a person of firmness, to prevent the patient doing any injury to himself or others. At the same time he must have a good temper to bear the whims of the patient, and to treat him with the greatest kindness and humanity, soothing language acting like an opiate or charm; whereas contradiction, harshness, and violence, only aggravate the disease by exciting the maniacal paroxysm.

As this maniacal state bears the character more of a moral than a medical disease, I think great and good effects may be gained by permitting the visits of sensible religious friends or clergymen, with soothing language and persuasive arguments, to converse with and reason upon the absurd religious notions the patient has adopted, in consequence of the diseased state of his imagination and perversion of his judgment, such as considering himself the Saviour of the World, or some great prophet, or the harbinger of the millenium. This latter idea, singular to say, prevails most in mania, the product of a "*coup de soleil*." They should not talk to the patient as if his opinions were absurd; but state how others were affected similarly, and the patient will perhaps apply this reasoning to himself. The clergymen or friends who are allowed to visit should be persons of considerable abilities and ready-witted; for I have observed that when the disease has not ended in fatuity or effusion, the patient has great brilliancy of ideas, and his reasoning powers are very acute. Were he therefore to get the mastery in argument, it would only be confirming him in his absurd chimeras; but, on the contrary, were he good-humouredly foiled in his notions, he would discard them, and thereby recover his reason. On the patient's recovery he should live in close retirement, for many months, in the country, avoiding all business and society that would produce any mental exertion, so that the brain and nervous system may regain their tone, which is best done by the absence of all mental stimuli. Great care should be taken to keep the bowels open by gentle laxatives and moderate exercise.

If this plan cannot be adopted at home, either from the obstinacy of the patient, or inability to procure a proper attendant, in that case, he should be placed in a public or private asylum for lunatics. These places were formerly dreaded justly, both by patients and their friends, but are now in many instances carried on in a highly creditable manner. From the enlightened state of the country, and from the investigations of Parliament, a new light has broke in upon these establishments. It is now known that it is not necessary to treat the maniac as a criminal, or that he should be flogged, or starved by cold and hunger. The time has now arrived when the patient may be deprived of his liberty, yet enjoy the freedom of his limbs, and thereby benefit his health. It is also found, that though he may be deprived of his reason, yet the feelings of

hunger, thirst, and cold, and heat, are still in existence, and must be attended to by an adequate supply of wholesome nutritious food, fluids, clothing, fire, and exercise.

I could adduce various cases in proof of the justice of my remarks on this disease, (*Phrenitis Chronica*,) produced by the great heat of the sun; but one may suffice.

This occurred to an individual in the army of the Duke of Wellington, after the action of Talavera in Spain, while on the masterly retreat of his army into Portugal, in order to occupy the lines of Torres Vedras. The subject of it had to perform some arduous duties, during which he was much fatigued and long exposed to an ardent sun. After this he became restless night and day, agitated by trifles. On any thing pleasant occurring, he was overpowered by joyous feelings, that rendered him very loquacious. His whole manner gave him the appearance of having drank too much. He felt no inclination for eating, and when he did eat, he swallowed the morsel without masticating it. He was always thirsty. Excessively melancholy on the most trivial occasions, when in his excited state, he became very irritable on the most trifling occurrence. Sleep he could only procure on alternate nights, and even then very little of it. This state continued for some time, during which he went about doing duty. All the symptoms quickly became aggravated. His head felt as if it were distended, or as if the brain was becoming too large for the skull; and his eyes also felt full, and appeared very dazzling. His pulse was quick and irritable, and his tongue foul. Shortly after, he felt pain in the region of the spleen, then in the right lobe of the liver. The stomach then became affected by pain, vomiting, and severe heart-burn. After eating or speaking much, or becoming excited by any means, mouthfuls of food hardly changed were ejected from the stomach; and indeed complete and alarming dyspepsia came on. The bowels were sometimes costive, but more frequently lax. The faces were of a colour that indicated a great deficiency in the biliary secretion.

In this state he applied to the surgeon of the regiment, and hoped that he would relieve the state of his head by ample bleeding; but this the surgeon absolutely refused. After inquiring fully into the state of the case, and finding, from the length of time that he had been afflicted, that it was of a chronic nature, he ordered his head to be shaved, and to be kept covered by cloths continually soaked with vinegar and water. He opened the bowels well by calomel and jalap, assisted by draughts of infusion of senna with Epsom salts. The patient became more and more confused, till reason entirely left its seat, and a maniacal paroxysm was induced. A complete cap-blister was put on all over the head. Soon after this he recovered his reason; nourishing diet was given him; and by the aid of a few laxatives he was able to return to duty in a fortnight.

About four months afterwards, in 1811, si-

milar causes produced a very slight attack. He felt it coming on, and applied to the surgeon; but confinement for a few days, and gentle opening medicine, removed it. He had no attack until the year 1814, when in Portugal, on the point of embarking for England. His mind was greatly distressed on hearing of the death of a near relation, and a slight relapse was the consequence; but confinement to his room for a few days, and mild treatment, removed it. After this he travelled much, crossed the Alps, and passed through Italy. He was at the action of Waterloo; and was in France afterwards with his regiment. He felt no return of his former malady until the year 1819, when it was quickly removed by gentle laxatives, and he was not under the necessity of keeping within doors. He remained in good health in Scotland, until July 1826; a summer that will be long remembered in Great Britain for the intensity of its heat, great drought, and premature harvest, as also for the number of cases of bilious fevers, cholera, diarrhœa, and *coup de soleil*, chiefly of the species I have termed apoplectic, terminating fatally. At this period he exposed himself without his hat for many hours working very laboriously, until the perspiration was pouring from him, which he was never accustomed to do. On going to tea in the evening he had no appetite; and he felt his head confused. At last intense headach came on, attended with stupor, and followed by complete delirium. An able and highly esteemed surgeon who was called, bled him largely, in all at different times to the amount of 100 ounces, from the arm; shaved the head; applied a large cap-blister to it; opened the bowels freely; and enforced a most rigid antiphlogistic regimen.

After this the disease assumed the chronic type. He was sanè on most points, but evidently insane on others. He had lost all recollection of dates and events, and forgot every thing that was told him only the minute before. The surgeon never inquired particularly into his case, or whether he had been similarly affected formerly; he therefore continued reducing his patient by giving him daily purgatives for nearly two months; and considering the liver to be affected, from his patient having been in a warm climate, he earnestly urged an alterative course of mercury, to which his patient objected, and rebelled against taking any more medicines. At this time his weakness was so great, that he passed his urine and faces involuntarily. He complained of faintness from hunger, but was allowed little or no solid food. A consultation of medical men met on his case, and advised him to be sent to a private asylum for the insane. On his admission he was immediately put on a mixed diet of animal and vegetable food, with malt liquor. I saw him a few days afterwards, and was delighted to find him walking about, but still insane. A seton was put in the neck, and in eight or ten days he became quite sensible, and increased in strength daily; and the account that I had

from him afterwards was, that he found great difficulty in restraining his appetite, which was ravenous. The history of this case demonstrates the advantage of treating maniacal, or head cases in the mildest manner, with little or no restraint, and by nourishing diet. It presents some difference from my general statement respecting the loss of recollection; but, as it elucidates best in other respects what I wished to prove, I think it worthy of being quoted.

From the London Medical and Physical Journal.

ON THE SPONTANEOUS EVOLUTION OF THE FŒTUS.

By GEORGE JEWEL, Esq.

When we reflect upon the revolving changes which the several branches of medical science have undergone through succeeding ages, none appear more conspicuous than those which appertain to midwifery. It is, indeed, a fact too palpable to be refuted, that hitherto its principles have neither been so stable or determinate as those which belong to medicine generally: a circumstance, it is fair to presume, attributable to its defective cultivation as a branch of the healing art. Midwifery, unfortunately, has been left, for a long series of years, entirely unprotected by the medical corporate bodies of this kingdom, and, as a natural result, it has never been fully appreciated by students and junior practitioners as an important branch of science. Indeed, it is scarcely exceeding the bounds of truth to say, that very many practitioners of the present day have become acquainted with the mechanical delivery of women in laborious parturition by experience only, and that experience sometimes too dearly bought, while the principles of the science have been left totally uncultivated, frequently unnoticed. If the opinion be correct that the principles of midwifery have been to a certain extent neglected, and it scarcely admits of doubt, it cannot excite surprise that many of the phenomena of parturition should pass disregarded.

The object of this communication is to draw the attention of practitioners to that peculiar condition of the fœtus, which obtains in one species of what are termed preternatural labours, and to induce a further development of facts; for it is upon this alone the solid pyramid of science can be raised.

The records of medicine inform us that, among women in all ages, the function of parturition has been not unfrequently interrupted by the cross position of the infant. To convert the preternatural into a natural presentation, or, in other words, to bring the head of the child, when an arm presented, in apposition to the os uteri, must have been (to say the least of it) a very precarious mode of delivery; in fact, one which seldom could be crowned with success; and, if foiled in the attempt, cutting instruments were had recourse to, under all circumstances, and at any period of the labour, with which they mutilated the

child, that it might be extracted piecemeal through the pelvis. In justice, however, it should be stated, that formerly the various conditions and capabilities of the uterine fibre was not well understood; and it is upon a knowledge of these that the success of obstetric medicine principally depends.

It had been remarked by some of the most eminent accoucheurs of this and other countries, that in some few cases where an upper extremity of the child was detected as the presenting part soon after the commencement of labour, the nature of the presentation became materially altered before the process was wholly accomplished. Dr. Denman was the first English physician who directed the attention of practitioners to this interesting phenomenon, and which he designated "the spontaneous evolution of the fœtus." The arm or shoulder, he imagined, sometimes presented, but, by the power of the natural efforts, the child turned upon its own axis, the nates ultimately became forced into the pelvic cavity, which compelled the part originally presenting to recede into the uterus. This explanation, however plausible it appeared to some, failed in proving satisfactory to others. Dr. Douglas ably combated the theoretical doctrines of Denman, while at the same time he illustrated his particular views of the subject by the publication of seven cases which had occurred under his own observation.

The two following cases which I have recently met with in my own practice, will prove strong corroborative testimony to the opinion that no spontaneous evolution of the fœtus ever takes place, but that the child, by the extraordinary exertion of the uterine power, is merely expelled in a doubled position.

CASE I.—Mary Davey, ætat. thirty-six, residing in Turner's-court, St. Martin's-lane, a poor woman, of short stature, a delicate constitution, and arrived at the full period of utero-gestation, was seized with labour early in the morning of the 1st of June, 1826. On the subsequent day, in the evening, I was sent for by the midwife in attendance. Upon entering the chamber, I observed that the uterine power was exceedingly and most fearfully exerted; large drops of perspiration stood upon her forehead and neck, and there was scarcely a minute's interval between the pains. On making an examination per vaginam, I found the shoulder pressed into the inferior aperture of the pelvis, the head having dropped through the os externum. The idea of turning could not be for a moment entertained under existing circumstances, and I found, during a few forcible contractions of the uterus, that the body of the child had become so compressed into the lower division of the pelvis, that a portion of the thorax could be detected almost at the os externum.

Having waited a few minutes to reflect upon the best means I could adopt to meet the exigencies of the case, a pain of augmented severity came on, which caused the woman to scream violently. The midwife now, and as it appeared by design, raised the bedclothes,

when I had an opportunity of ascertaining, by ocular demonstration, the precise mechanism of the labour. The arm had already passed through the external parts from the posterior part of the pelvis; by a forcible uterine contraction, the nates appeared, and during the same pain the whole body was expelled. It must be remarked, that the arm neither retracted nor changed its original position in any part of the process. The head was extracted without much difficulty, the child being dead.

The unfortunate subject of this case, whose constitution, as was before remarked, had been always weakly, died the following morning from exhaustion, the effect of the over active uterine power, and great general disturbance of the system.

Upon an examination of the body, the space in the antero-posterior diameter of the pelvis was found not to exceed three and a half inches, although the child was of the usual size. These are circumstances which materially add to the interest of the case. The uterine parietes were softer than natural, and appeared of a dark gangrenous colour.

CASE II.—The wife of a respectable tradesman, residing in the Waterloo-road, forty years of age, and of a robust constitution, was seized with the pains of parturition on Sunday morning, October the 21st, 1827, being the third labour. On my arrival at 10 A. M. I found her standing on the floor, notwithstanding the uterus was contracting with extraordinary force every three or four minutes. At my request she immediately got into bed, and having made the usual examination, the right hand of the child was discovered at the os externum, the shoulder under the symphysis pubis. In this, as in the former case, the efforts of the uterus were most powerfully exerted, and I observed that, during the two subsequent pains, a portion of the chest of the fœtus had arrived at the external parts. I now resolved to confide (at least for a time) in the natural powers, and for the following reasons: first, from the parturient action being most excessively severe; secondly, the whole of the shoulder, and part of the thorax, were rapidly approximating to the os externum; and thirdly, the parts were relaxed and lubricated by a plentiful secretion of mucus. That I might not come to any erroneous conclusion regarding the mechanism of the case, I held the hand of the child loosely within my own, by which I was again enabled to perceive that, so far from the original presentation retracting, scarcely any movement whatever took place in it during the process.

Within twenty minutes from the first examination, the breech presented, and the child was expelled, as in the other instance, without artificial assistance.

It is necessary I should remark, that the patient had only arrived at the eighth month of pregnancy, and the child was dead; a circumstance attributed to an accident which occurred about ten days previous to the coming on of labour. The mother did well.

In obstetrics, as in the practice of all the

other branches of medicine, the interests of science and humanity demand from us a due attention to the capability and resources of nature; that we should investigate into, and be strict observers of, her operations; and that we should unite in drawing a line of demarcation between cases which require the scientific interference of art, and others which may be safely entrusted to the unaided exertion of the natural powers. Dr. Douglas, in his well known pamphlet, published in the year 1819, "the Spontaneous Evolution of the Fœtus," states his conviction that at least one-third "of all cases of cross birth" ought not to be subjected to artificial turning. Now, if this belief, founded unquestionably on fact and observation, approaches in any degree to the truth, is it not somewhat extraordinary that so little attention has been paid to a subject which is of such vast importance to the science of obstetrics, and, as a natural consequence, to the best interests of society? After some practical attention to this interesting part of obstetric pathology, I have been led to the following conclusions, not without a hope of seeing them confirmed by the experience of others.

That when the arm and shoulder, together with a portion of the thorax, of the child are detected at the os externum,—when the uterine vigour is most powerfully exerted, and the woman bears down involuntarily with all her strength,—when the parts are disposed to relax freely, there being a due secretion of mucus, and the mother has previously borne children, the practitioner should not interfere. To these may be superadded a healthy conformation of the pelvis, the full period of gestation not having arrived, and the child being dead. Under all the circumstances above mentioned, more particularly the concurrence of great uterine activity, a fair opportunity should be permitted for the accomplishment of labour by the natural powers alone. I cannot coincide with Dr. Denman's theory, "that a child of the common size, living or but lately dead, in such a state as to possess some degree of resiliency, is the best calculated for expulsion in this manner." On the contrary, I am induced to believe that the resiliency spoken of would materially contribute to the resistance opposed to the uterine power, and, instead of facilitating, would rather prove an additional obstruction to the accomplishment of the process. That when the arm of the child is protruded into the vagina, it never again recedes to make room for the nates or any other part, as imagined by Dr. Denman, and therefore that the young practitioner would be led into a practical error if he waited for its occurrence as a matter of course.

It is, however, much to be feared that such cases as I have detailed but rarely occur; at least, that they form a small portion only of what are commonly denominated preternatural labours, and, therefore, that although the practitioner possesses a knowledge of the fact that occasionally, in presentations of the upper extremities, the process of labour is accomplished without the interference of art,

yet, as it is not possible to calculate, with any degree of accuracy at the commencement of a case, upon its probable termination, so will it be judicious to turn and deliver as soon as the condition of the uterus will permit; and again, on the other hand, where procrastination has usurped the place of prompt measures; when the arm is wedged in the pelvis, and the uterus is morbidly exerting its tonic contractions,—and the death of the infant is unquestionably marked,—to pursue a mode of treatment more compatible with the safety of the mother, in removing the arm, or by a further mutilation of the child, to enable the operator to bring it with greater facility through the pelvis.

From the *Revue Medicale*.

OPENING OF THE FORAMEN OVALE,
with general contraction of the Arteries, un-
accompanied by Cyanosis. By M. MIQUEL.

Jean Antoine Adam, toyman, aged thirty-six years, entered La Charité under the care of Professor Cayol, 22d August, 1825; his complexion was fair and florid, stature small, and excepting occasional paroxysms of dyspnœa, returning at irregular periods, and terminating sometimes in syncope; he had never undergone any serious disease. He was married, and had several children, without having observed any increase in the frequency of the attacks, which generally varied from one to two monthly, and were supposed by him, to be of a nervous character.

At the age of thirty years, without any change in his habits or manner of living, mental or corporeal commotion, or any evident cause, the paroxysms suddenly assumed an unusual intensity and frequency; during eight days, two, three, and even four, occurred in the twenty-four hours, with such severity as to threaten existence; his countenance immediately became flushed, and acute pain in the head and region of the heart, with strong pulsations of the latter, and the neighbouring arteries, continued for the space of a minute, when he became pale, and syncope supervened; from which state he was recovered by the usual means. After the lapse of one paroxysm, he enjoyed his usual health, till the accession of another. It may be well to state, that the disease in its commencement, was mistaken for a malignant fever, and that cinchona in substance, was given in large doses, with the view of arresting its course; far from mitigating the symptoms, they were all augmented in consequence of this treatment.

After having passed a week in this state of vacillation, between life and death, a further change took place on the eighth day; the dyspnœa, which had before occurred at intervals, now became almost continual, accompanied with extreme anxiety, violent palpitations of the heart, intense cephalalgia, &c. Venesection was directed, and was productive of immediate and great relief; the patient continued to enjoy an exemption from the more violent symptoms, for about a month after,

when they reacquired their previous intensity, and the operation was repeated with the same success, as before. It was to this means indeed, performed monthly, and the frequent application of leeches, to remove the local pain and congestion, that the unfortunate patient referred the preservation of his life for the last six years; he thought it no exaggeration to say, that the number of leeches which had been applied since the commencement of his disease, exceeded six thousand.

The following were the symptoms, presented at his entrance into the hospital; countenance pale and emaciated, without the slightest tint of blue; respiration short, hurried and laborious; orthopnoea, a slight but troublesome cough; the thorax returned a good sound upon percussion, and the respiratory murmur was heard remarkably well throughout; the whole body was agitated by the violent action of the heart, the tumultuous and irregular pulsations of which, were particularly distinct on the left side, where a hissing, or grating sound was also perceptible. The sound was dull over the precordial region; the pulse small, unequal and intermitting, contrasted with the action of the heart; the lower extremities were œdematous. The abdomen enlarged and tense, presented an evident fluctuation; the extremities were cold, and the temperature of the whole body appeared lower than ordinary. With the exception of a slight degree of constipation, there was no disturbance in the digestive functions.

From a consideration of the preceding symptoms, M. Cayol drew up the following diagnosis; *hypertrophy to a considerable extent, of the left ventricle, with contraction of the orifice of the aorta, arising from an incipient ossification of the sigmoid valves.* A diuretic pisan was prescribed, with half a drachm of the acetate of potash, and a mixture with the same quantity of laurel water.

On the 24th, and the two succeeding days, the abdomen increased in size, the constipation and paucity of urine continued, the œdema extended to the thighs; the countenance was bloated, and the hissing sound above mentioned, assumed still more of a grating character. The quantity of the acetate of potash was increased to a drachm, and an ounce of the oxymel of squills was added to the portion. 27th and 28th. The patient continued to grow worse; he could respire only in an upright position, his abdomen and lower extremities were much distended, the secretion of urine had almost entirely ceased; the tumefaction of the face increased, the anxiety was extreme, pulse almost imperceptible, a general coldness over the whole body, and the suffocation imminent.

It is unnecessary to continue longer, the diurnal detail of symptoms, which, with some momentary alleviation from the fumes of stramonium, terminated in the death of the patient on the 11th of the following month; a few days previous to this event, emphysema was detected at the base of the right lung, extending subsequently, to the left. Upon

dissection, thirty six hours after death, the body presented a remarkable degree of paleness, without any of the rigidity of death; the heart, distending the pericardium, and compressing the left lung, was at least twice its natural size. The parietes of the left ventricle were firm and thickened, and its capacity about a third greater than ordinary; the auricle of the same side, was also dilated and thickened in structure. Several coagula of blood were found in the right ventricle and auricle, which cavities were about a moiety greater than usual, without having undergone however, any considerable increase of thickness. Between the two auricles, there was an opening about the size of a two franc piece, with smooth and rounded margins, evidently the non-obiterated foramen ovale. The pulmonary veins were considerably dilated, as far even as the centre of the pulmonary tissue; their lining membrane was of a vivid red, especially in the neighbourhood of the left auricle, which was also of a deeper colour than ordinary. The mitral valve was rough to the touch, and contained four or five ossifications, about the same number of lines in diameter. The aorta, throughout its whole extent, was contracted to less than half its natural calibre, and it was only by dint of considerable exertion, that the index finger could be introduced into its largest part; the contraction was greater at its origin, by reason of the ossification of the valves, and scarcely admitted the introduction of the little finger. The parietes of this vessel were sound throughout, with the exception of three or four minute ossifications, immediately above the valves. All the arteries of the body participated in this diminution of volume, scarcely equalling in diameter those of a child twelve years of age; the iliac and carotid arteries would have admitted with difficulty, the introduction of a writing quill.

There were no adhesions observed in the lungs; that on the right side, presented in its two inferior thirds, a combination of vesicula and interlobular, emphysema; the branches of the bronchiæ and pulmonary veins, were found considerably dilated. The left lung slightly compressed, and pushed backwards by the enlarged heart, was crepitating throughout, with the exception of its inferior lobe, in which there was an engorgement of sanguineous serum; it was slightly emphysematous.

The appearance of the abdominal viscera, did not differ greatly, from that observed in ordinary cases of ascites.

Remarks. Besides the absence of cyanosis, which has been noticed as one of the most important circumstances connected with the preceding case, it differs in several other respects, from those hitherto recorded upon the same object. Thus, where the foramen has remained unobliterated after birth, independently of the blue colour, which is frequently met with, but which would appear not to be necessarily, the result of the mixture of black and red blood; physicians have described as invariable concomitants, diminished temperature of the body, habitual dyspnoea, constant

palpitation, and frequent syncope. In the numerous cases of the *re-establishment of the foramen ovale in adults*, collected by Corvisart and Laennec, these great physicians have constantly observed that it was preceded by a fall, blow, or some violent physical commotion of the chest. Now, in the present instance, we are unable to determine positively, whether it should be considered as a case of the *non-ob-literation* or *re-establishment* of the foramen ovale, for, on the one hand, till the thirtieth year of his age, the patient had not been afflicted with constant dyspnœa, or palpitation, and with the exception of the occasional paroxysms before mentioned, had ever enjoyed the best health; while on the other, we do not observe the characteristic symptoms of the particular disease of the heart, under consideration; that sudden invasion attendant upon the re-establishment of the opening in adults; nor the external causes, coinciding with the appearance of the symptoms. The violent palpitations, syncope returning twice during the month, and the pain in the region of the heart, sufficiently indicate this organ as the seat of the disease, but how are we to account for the intermission of the symptoms? One of two things must be admitted, either the mixture of red and black blood continued from birth, and consequently the symptoms found in authors as indicative of the disease, may occur paroxysmally, leaving the patient in ordinary health during the intervals, and only become continual, when the diameter of the opening has acquired a certain magnitude; or, what is not less curious, the mixture of the two fluids, prior to his thirtieth year, took place only occasionally, giving rise to the symptoms above narrated. In what then, it may be asked, consisted the essence of the malady? Can it be referred to a spasm of the heart, a neurosis of the nature perhaps, of angina pectoris, which (the complete union of the valvular folds of the foramen not having taken place, a circumstance frequently observed in dissections) permitted, for a short period, the communication of the two ventricles, and thus suddenly occasioned the vivid commotion of the heart and head, syncope, &c?

The universal contraction of the arteries, is also a very rare and singular circumstance, the annals of medicine afford only four or five similar examples; and it is not improbable, that this disposition may have exerted some influence upon the formation of the opening, either in exciting the spasm above mentioned, or by giving rise to the hypertrophy of the left auricle, which would have augmented the impulse of the blood against the disunited parietes.

We may remark also, the accuracy of the diagnosis of Professor Cayol, and how much the organic lesions were in accordance with the symptoms developed during life. With the exception of the existence of the foramen, all was known prior to the autopsy; that indefinable and tumultuous *bruissement*, noticed by Corvisart in this affection, was several times observed; the dullness of the sound, and impulsion against the left side of the chest,

was explained by the hypertrophy of the left side of the heart; the grating sound, by the ossification of the valves; the smallness of the pulse, by the contraction of the arteries; its irregularity, by the obstruction at the origin of the aorta; and the sonorousness and unequal crepitating râle, by the pulmonary emphysema. In relation to the dilatation of the pulmonary veins, and right cavities of the heart, it was impossible *a priori* to recognise their existence,—they are sufficiently explained, however, by the extensibility of the parietes of the former, and the retrograde movement of the blood, unable to pass through into the left ventricle.

From the London Medical Repository.

ON THE INTERNAL EXHIBITION OF THE ACETATE OF LEAD.

The above journal contains some interesting observations and experiments, by William Laidlaw, Esq. Surgeon, on the internal administration of the Acetate of Lead, "Chiefly with a view of determining to what extent it may be safely administered in the cure of disease, especially in Uterine Hemorrhages." As the practice of exhibiting this article in large doses, is by no means new to American physicians, we have thought that the paper in question would well admit of abridgment; the rather, that from its length it would otherwise encroach upon space, which will perhaps be more advantageously occupied by other articles.

After observing that no argument drawn from the ill consequences attending the gradual introduction of this mineral into the system, could be adduced as equally precluding its judicious employment, by which he understands, "the administration of it in such quantities as shall most speedily, and therefore most safely, cure the disease for which it is exhibited;" and adverting to the inadequacy of the experiments of Orfila, whose object indeed was limited to determining the effects arising from the operation of excessive quantities of the article, with a view to the adoption of the most proper remedial measures; Mr. Laidlaw relates an experiment made upon himself, in order to ascertain to what extent it might be safely carried. He commenced with the following formula:—*R. Plumbi superacetatis ʒj; opii gr. viii; extracti gentianæ ʒj; acidi acetici dil. q. s.; subige in massam dividendam in pilulas octodecim æquales, e quibus, ter quotidie una sumatur.*

"Sept. 12th. When the taking of these pills was commenced the health was perfect, and no deviation from this state was observed till the evening of the 14th, when the pulse was found somewhat slower, and a metallic taste in the mouth.

16th. The last two pills on the 14th were taken within two hours; no unpleasant effects have been experienced from that circumstance; pulse, whilst in bed, sixty, and indistinct; after exercise, sixty-four, and more distinct; metallic taste stronger, with some ten-

derness of the gums; but having been engaged for some days in putting up preparations in a solution of the muriate of mercury, am in doubt whether the tenderness of the gums is to be attributed to this circumstance or to the acetate of lead. Forty grains having now been taken, the last seven within two hours of each other, without any other perceptible inconvenience having been produced than a metallic taste, and perhaps some tenderness of the gums and constipation; it was now wished to ascertain the effect of a larger dose; ten grains were therefore taken at once: immediately after, slight pain of the stomach and nausea were felt; pulse fifty-eight, and weak.

17th. Hora septima, A. M. Pain of stomach and nausea did not increase after last report; sleep much disturbed from dreams; pulse whilst in bed fifty, and so indistinct that it was counted with difficulty; no stool since the 12th; urine diminished and high coloured; some inconvenience experienced from weakness, especially at the knees.

Hora octava, P. M. Pulse fifty-six; weakness continues; pain of stomach increased; took ten grains of the extract of colocynth, and two of opium.

18th. Hora quarta, A. M. Was awake at this hour with severe and unremitting pain of stomach and nausea; vomiting suppressed with difficulty. Immediately took three drachms of the sulphate of magnesia in solution; pain instantaneously much relieved; shortly after went to sleep; awoke at seven, and found the pain entirely gone; repeated a similar quantity of the sulphate of magnesia; pulse sixty, weak but distinct; weakness of knees somewhat diminished; urine more free, of a dark olive colour, and sweetish.

The pain did not return, and without further assistance from medicine, in a few days, I had perfectly recovered from every unpleasant sensation. When the experiment was commenced, paralysis and convulsions, which are the severest, but rather the accidental than the usual effects of the introduction of this salt into the system, were not much dreaded; but it certainly was expected that I should have been able to have continued it until colica was induced. The interruption which prevented this effect, I think there can be no doubt, must be attributed to the last dose, ten grains. I shall, however, shortly resume the experiment, and hope, by continuing the three-grain doses, to be able, by the result, to ascertain not only the most appropriate quantity for a dose, but also the extent to which it may be safely given for the cure of diseases, without the hazard of inducing others.

In the mean time, it is presumed, it will be deemed allowable, from this experiment, to infer that the acetate of lead, combined with opium, may be given in fully three-grain doses, to the extent of ten grains for five days successively, without danger of inducing colica pictonum.

This much, I think, may be safely asserted, both as to the mode of its exhibition and ultimate extent. Because although uneasiness was

experienced, yet that uneasiness was, unequivocally, not colica, but gastrodynia, and it is presumed, was evidently referrible, not to the aggregate amount of the acetate of lead taken, but to the excess of the last dose; not to the specific effect, as colica is presumed to be, but to the styptic quality of the salt. The sensation, excepting the nausea, precisely resembled in kind, though much greater in degree, what I have often experienced from eating acid fruit, such as sour plums. That the pain arose from the styptic quality of the salt, appears to be corroborated by the instantaneous relief obtained, as I conceive, from the decomposition effected in the stomach by the sulphate of magnesia. Besides, in colica pictonum all kinds of ingesta, for the most part, increase the pains, and the disease requires days, if not weeks, to be subdued; but the removal of the pain in the experiment was almost instantaneous.

No perceptible inconvenience was felt as long as the doses, which were somewhat more than three grains, were continued as at the commencement, and only slight nausea when two of them were taken within two hours; from which it may be presumed that, in severe cases of uterine hæmorrhage, such doses may be given every second or third hour, until the discharge is suppressed, nausea induced, or fifty grains taken.

Of the influence of this salt on the animal economy, that on the circulation appears most worthy of attention. The pulse, at the termination of the experiment, was as slow as fifty pulsations in a minute. It was observed to be similarly affected in four of the six cases of colica pictonum quoted by M. Orfila from the dissertation of M. Merat.* In one of these cases it was so slow as to give only forty pulsations in a minute. This sedative property is particularly valuable in hæmorrhage, by diminishing generally the irritability of the whole system, and especially that of the affected part, and consequently, the impetus of the circulation, to some extent. To obtain this effect, rest and quiet must be strictly maintained, for even by gentle exercise the pulse rose from four to ten pulsations in a minute.

But as a valuable remedy in hæmorrhage, not only are its sedative properties to be considered, its decisive astringent qualities are also to be taken into view. These seem to operate, not only when immediately applied to the affected part, but also, nearly with equal success, when extended by sympathetic action. These were in some degree evinced in the experiment, by the diminished secretion of urine, and the constipating effect on the bowels. But more decisively are they marked in the cases with which this paper is concluded, where the suppression of the discharges is distinctly and unequivocally referrible to their operation. The vast superiority of this medicine, to every other of its class, appears to depend, not on either of the above

* Vide Toxicology, Vol. I. p. 466 to 473.

properties taken separately, but on their conjoint action, and that too in a way peculiar to itself; for the combination of sedatives and other astringents is not found to produce similar effects. In the severe case of hæmatemesis where this was tried, no perceptible impression was made in checking the malady; but the operation of this invaluable remedy was conspicuously decisive. The vomiting never returned after the first dose. It is also, perhaps, to the conjoint operation of the sedative and astringent properties of this medicine, that the vertigo in case third, was removed at the same time that the hæmorrhage was suppressed. And to the same, I attribute its valuable results in all diseases, where it is an object of importance to suppress either hæmorrhages or increased secretion, such as happen in epistaxis, hæmoptysis, hæmatemesis, hæmorrhagia purpura, hæmorrhoids fluens, menorrhagia, hæmaturia, leucorrhœa, gonorrhœa, diarrhœa, and dysentery.

In its exhibition, it is indispensable that it should be in all cases combined with opium. The proportion of opium requisite will, necessarily, vary according to the peculiarities of the constitution of those to whom the salt is to be administered. In general, however, one of opium to eight of the salt, will be found sufficient to prevent griping. If that be inadequate, it must be gradually increased, until the inconvenience is obviated.

Perhaps crumb of bread makes the best pill mass, or equal parts of that and extract of gentian, with a sufficient quantity of distilled vinegar or water. As sugar partially decomposes it, neither conserves nor sirups are proper for the formation of pills. As it is very easily decomposed, to insure its proper effect, it is of importance, during its exhibition, carefully to avoid not only the alkalies, neutral salts, and mineral acids, which decompose it rapidly, but also the alkaline earths, and their carbonates, which, although they do not produce that effect so entirely, yet diminish its properties so materially as greatly to vary its results. Broths also decompose it, and likewise porter. But what ought particularly to be remembered, as most likely to be overlooked, is, that the same effect is produced by a strong infusion of tea. Wine does not affect it with the exception of Burgundy. But so much is it disturbed by a variety of other articles of food, that I always order it, if possible, to be taken equi-distant from meals. If the stomach can bear it, a wine-glassful of equal parts of distilled vinegar and water, half an hour after each dose, will render its effects more certain."

The observations of Mr. Laidlaw are continued in the next number of the Repository.

"Having been unexpectedly interrupted in the essay to ascertain the maximum which might be taken without inducing other diseases, especially colica pictonum, I stated that that attempt would be shortly resumed. It has now been accomplished, and again interrupted, after having taken seventy grains, by other means than the dreaded colica pictonum.

The details of the first experiment are now before you, and if you shall judge them worthy a place in your Repository, the details of the second will also be forwarded to you.

The trials I have made on myself have been in the solid form only. To hear of these experiments having been repeated would afford me much pleasure, but it would be still more gratifying were similar attempts made to ascertain the precise properties of the salt in solution. In this form it certainly acts more instantaneously, extensively, and energetically, than in the solid form.

Orfila found, by injecting thirteen grains of the acetate of lead, dissolved in a drachm and a half of distilled water, into the jugular vein of a small and weak dog, that the injection was hardly accomplished when the animal made three or four deep inspirations, and died, without the least sign of pain or convulsions. He was instantly opened, and the heart was found to beat forcibly. In a second experiment, five grains, dissolved in two drachms of distilled water, were injected into the jugular vein of a robust dog of middle size; the issue was more protracted, but was ultimately equally fatal; for the animal, after having shown symptoms of the nervous system being affected, died on the fifth day. In another experiment, ten grains of the acetate of lead, dissolved in two drachms of distilled water, were injected into the jugular vein of a dog of middle size; the animal appeared suffocated, his respiration became difficult, panting, and precipitate; and he died in thirty-five minutes after the injection.*

Orfila remarks on these experiments, that the cause of death appears to depend on lesion of the nervous system. But by what property of the salt he conceived this lesion to be produced he does not explain. He ranks the salt as an astringent poison, that frequently exerts its action on the nervous system. But it is not easy to conceive how the operation of an astringent property merely could so instantaneously destroy life. It is presumed to be more probable that, when directly introduced into the system, by injection, it is capable, by its sedative quality, of immediately affecting the brain, paralysing the muscles of respiration, and occasioning death by suffocation. In the first experiment, the animal, after the introduction of the solution, made only three or four deep inspirations, and died.

In the third experiment, after the injection of the solution, the animal appeared suffocated, his respiration became difficult, panting, and precipitate, and he died in thirty-five minutes. The circumstances attending the death of the animals in these two experiments, very much resemble the symptoms which occurred in the experiments of Mr. Brodie, when he employed for the poison alcohol, essential oil of bitter almonds, and the empyreumatic oil of tobacco, of the sedative effects of which on the brain, there can be no doubt.

* Toxicology, Vol. 1st, p. 459, 460. Exp. I. et II. III. in a note, p. ibid.

Now although the quantity of the acetate of lead recommended to be given in the fluid form, for the cure of diseases, is neither by any means so great, nor, from the mode of its administration, is such facility afforded for its nervous communication as in these experiments, yet, from the effects being unquestionably more rapid, as well as more diffusive than in the solid form, its exhibition will demand proportionally greater caution.

In the severe case of hæmatemesis, case 4th, in which I employed it, it was given in the proportion of two grains for a dose, to be repeated every fourth hour, should the vomiting of blood return. Six grains in all were exhibited, but as the vomiting did not recur after the first dose, perhaps not more than the second was absolutely necessary. Ten grains, in the solid form, have been taken by me for a dose, and perhaps some may deem even this injudicious, but after the experiments of Orfila, to attempt a similar quantity in the fluid would be extremely so.

Whether the solid or the fluid form is employed, the constitution appears very soon to be brought under the influence of its operation. On the second day, I perceived the metallic taste slightly, but on the third it was distinct. The operation of the fluid, however, is much more rapid, diffusive, and energetic, as appears both from the experiments of Orfila, and case 4th. From this distinction, there may be cases which obviously point out the employment of the one form in preference to the other. As when it is an object to produce the effect suddenly, or where the first impression of the remedy seems to be made by sympathetic action, as in hæmoptysis, epistaxis, the fluid form is indicated, and also in hæmorrhagia purpura, where sometimes the hæmorrhage is universal, the same indication holds good. But in diseases where the remedy is either brought into immediate contact with the affected parts, or nearly so, as in diarrhœa, dysentery, hæmorrhoids fluens, or in hæmorrhagia uterina, the solid form appears the most appropriate.

Case 3d.—K. E., aged 30. 1st August 1827. Has had three miscarriages in succession, viz. one in March, 1826; one in the August following, of twins, from which she suffered severely from flooding; and one in January last, that occasioned still more distress from a similar cause. During the first six weeks of her present indisposition, she has not been well for a longer period than from three to seven days at a time, and when the attacks recurred, they generally continued from ten to twelve days without intermission. Previous to the last miscarriage, she sustained much inconvenience from vertigo; its severity was so great, as to render her incapable of walking without assistance, and even continued after the miscarriage, to such a degree as to induce her medical attendant to decline employing the necessary means for the suppression of the discharge from which she was daily suffering. Subsequently, however, for this purpose, she took mixtures to the extent

of twelve half pints, without benefit, and then was advised to go into the country. The discharge still continuing to harass her, she became much debilitated, and very irritable, so much so, that even moderate exercise, or sudden alarm, brought on severe flooding. In July last, in one of these attacks, she lost from two to three quarts. At present a full pint is lost daily; the vertigo is so severe as to affect the sight. She is weak in her person, and desponding in her mind, from the supposition that she cannot recover: pulse 76, rather weak; appetite good; bowels regular.—*R.* *Aluminis purificati*, ʒss.; *zinci sulphatis*, gr. viii.; *magnesiæ sulphatis*, ʒij; *infusi rosæ*, ʒiiiss.; *syrupi rosæ*, ʒss. *Misce fiat mistura cujus, quater quotidie cochlearia duo ampla sumenda.* Let the recumbent posture be constantly maintained.

2d.—Medicine taken, complaints continue the same. *Repetatur medicamentum.*

3d.—No alteration in the discharge; vertigo is undiminished. *Intermittatur medicamentum.*—*R.* *Tincturæ kino*, ʒii.; *aquæ cinnamomi*, ʒiiss.; *syrupi aurantii*, ʒss. *Misce fiat mistura cujus, quater quotidie cochlearia duo ampla sumenda.*

4th.—No perceptible alteration either in the discharge or vertigo has taken place. *Repetr. mistura ut antea.*

5th.—Discharge still continues undiminished; vertigo rather increased; bowels confined. *Intermittatur medicamentum.*—*R.* *Plumbi superacetatis*, gr. xii.; *opii*, gr. ij.; *medullæ panis*, ʒj.; *acidi acetici*, dil. q. s. *Fiat massa dividenda in pilulas sex æquales, e quibus statim unam capiat, et si opus sit, omni horâ secunda repetatur.* *R.* *Rhei radices contriti*, *jalapæ radices contritæ* à ʒss.; *aquæ distillatæ* q. s. *Subige in massam dividendam in pilulas sexdecim æquales, e quibus pro re nata, duas capiat donec alvus leviter solvatur.*

6th.—The six pills of the acetate of lead taken, and eight of the laxatives; discharge is somewhat diminished; the bowels moved once. *Repetr. pil. plumbi superacetatis ut antea.*

7th.—Discharge continues to diminish; vertigo also somewhat abated in severity; no pain of stomach, or nausea; slight pains of the abdomen.—*R.* *Plumbi superacetatis*, gr. xii.; *opii*, gr. iv.; *extracti gentianæ*, *medullæ panis*, à gr. x.; *acidi acetici*, q. s. *Subige in massam dividendam in pilulas sex æquales, e quibus statim unam capiat, et si opus sit, quæque horâ secunda repetatur.*

8th.—Discharge appears only occasionally, and then in a slight degree; vertigo gone; no pain of stomach, nor nausea; pains of the abdomen gone; pulse 62, weak. *Rept. pil. ut antea.*

9th.—Two only of the pills taken; discharge has entirely disappeared; vertigo has not returned; pulse 62, weak; bowels have been kept gently open with the laxative pills. *Intermittatur medicamentum.*

13th.—No return of the discharge or vertigo; pulse 70, and of good strength; bowels regular.

This patient, after having taken twenty-four

grains of the acetate of lead, had pains in the abdomen, which certainly were produced by it; but they were entirely removed by increasing the proportion of opium on the 7th. From her circumstances in life, she was unable to give that attention to rest and quiet which is so necessary in such complaints, and, without doubt, much protracted the cure; but no permanent inconvenience arose from that circumstance. I saw her last month, she was much improved in her general health and appearance; there had been no return of the hæmorrhage nor vertigo; the catamenia had become perfectly regular.

Case 4.—E. J., aged 50. 8th May, 1827. Two years ago the catamenia ceased, and in about three months after this cessation, she began to expectorate blood every fourth or fifth week; was also affected with headach, and severe pains in the back. For these complaints, she had been cupped, and had taken a great variety of cathartic medicines without any marked relief. The quantity of blood hitherto expectorated had been inconsiderable; but this morning above a pint had been vomited at once. A cathartic mixture, composed of the sulphate of magnesia and the infusion of senna, was ordered, and directed to be taken so as to act freely on the bowels. On the 11th, notwithstanding that the bowels had been fully moved by the medicine, she suffered much from vertigo; had a fall from that circumstance, and received a wound on the right temple. After the fall severe sickness supervened, and she is reported to have vomited a large wash-hand basin two-thirds full of blood; vertigo still severe; pulse 70, and of good strength.—*R.* Mittatur sanguis e brachio ad ℥xii.; applicatur emp. cantharidis nuchæ. *R.* Aluminis purificati, gr. x.; acidi sulphurici, dil. gutt. xv.; magnesiæ sulphatis, ℥iii.; infusi rosæ, ℥xii. Misce fiat haustus, omni horâ sexta sumendus.

12th.—Vertigo much relieved from the bleeding, but is still troublesome; blister rose well, and discharges much; bowels open; pulse quick, small, and tremulous. Is reported to have vomited this morning nearly two quarts of blood. Continuatur haustus ut supra præscriptus.—*R.* Tincturæ opii, gutt. xv.; aquæ menthæ, pip. ℥j.; syrupi simplicis, ℥ij. Misce fiat haustus, ter quotidie sumendus.

13th.—No vomiting since yesterday; bowels open; pulse full, and frequent; was affected with delirium during the night.

Hora Tertia, P. M.—Was requested in haste to visit the patient, as she appeared to be dying from the large quantity of blood which she had just vomited, reported to be above two quarts. She was found much exhausted; pulse at the wrist with difficulty could be felt, was small, frequent, and intermittent; countenance sunk, and of a death-like aspect. Intermittatur medicamenta.—*R.* Plumbi superacetatis, gr. xvi.; tincturæ opii, ℥j.; acidi acetici diluti, ℥xv.; aquæ distillatæ, ℥ij. Misce fiat mistura cujus statim cochlear. unum

amplum adhibeatur, et si opus sit, quâque horâ quarta repetatur.

14th.—Three doses of the mixture have been exhibited; no recurrence of the vomiting since the commencement of taking it; has had a good night; pulse small, and frequent, but not intermittent. Intermittatur mistura.

Hora Octava.—Vomiting has not recurred; pulse 100, more distinct, and somewhat stronger.

15th.—No recurrence of the vomiting; vertigo gone; countenance slightly improved, but exhaustion still very great; pulse 90, and improves in strength.

16th.—The exhausted state of the patient is still alarming, but there has been no recurrence of the vomiting; the countenance continues to improve; pulse 90, and maintains the strength of yesterday.

The vomiting never returned; and although, from the extreme state of exhaustion to which the patient had been reduced, her recovery for some time was rendered doubtful; yet by cordials, light nourishing diet, and other necessary treatment, she slowly, but gradually increased in strength: and so much had she improved in this respect in July, that it was judged necessary, from symptoms of vertigo, she should lose a small quantity of blood; and in September, for the same reason, a similar quantity. By this treatment, she now enjoys better health than she has done at any period since the cessation of the catamenia."

From the Journal des Progres des Sciences et Institutions Medicales.

EXPERIMENTS UPON THE SECRETION OF BILE.

By SIMON DE METZ, D. M. P.

The biliary secretion is an interesting branch of physiology, still involved in much obscurity, by reason of the difficulties which have occurred to those who have undertaken to demonstrate the mechanism by which it is effected.

Is the bile, formed from arterial blood, in like manner with the other secretions? from that of the vena portæ? or rather do both these fluids concur in its production? Such are the questions that have long been agitated in relation to this secretion, and for the solution of which, I have made a great number of experiments, which appear to me, to throw some light on this subject.

It has been observed that it was extremely difficult, if not altogether impossible, to include in a ligature the vessels of the liver, and I have remarked that this difficulty depended upon the species, and even the age of the animals upon which the experiments are made; thus it is, that what has been deemed impracticable upon dogs,* has afforded results, more

* "It has been said, that the biliary secretion has continued, notwithstanding the ligature of the hepatic artery; but this ligature cannot be applied, without lacerating the parts

or less satisfactory, when rabbits and pigeons were the subjects of the experiments; and in these two species, I have observed, that the results differed in relation to the intensity of the symptoms produced by the different ligatures.

In the two animals above mentioned, I have been enabled to tie separately, the celiac trunk, or the hepatic artery; only the vena portæ, or the excretory ducts; and the obstruction thus occasioned in these several vessels, has given rise to different phenomena. But as the experiments made upon rabbits were not so strikingly marked as those upon pigeons; and as the latter, moreover, have appeared to me entirely sufficient for the object in view, I shall confine myself to the detail of those which I have instituted upon these animals.

Pigeons it is known are unprovided with a gall bladder; they are furnished instead with two hepatic ducts; one, through which the bile flows almost uninterruptedly, opens near the stomach; the other, frequently found empty, is longer and more delicate, and terminates further down in the small intestines. The trunk of the hepatic artery is very small, and deeply seated, so that it is difficult to include it in a ligature; it can be accomplished however, by means of very small crooked needles, assisted with the forceps. After the death of the animal, I have invariably injected the vessels, in order to ascertain that the ligatures had been properly applied.

1st. When the two hepatic ducts are tied, the secretion of bile continues, the liver becomes engorged and filled with globules of a beautiful green colour, which are observed principally upon the surface of that organ, tinging the neighbouring viscera, the pericardium, omentum, intestines, &c. Life continued generally from twenty-four to thirty-six hours, and the green colour was the more evident, in proportion to the age of the animal and the length of time it survived the experiment.

From ten to twenty hours after the application of the ligature, an important circumstance occurs, well deserving attention; about this time, the animal discharges per anum, a quantity of green matter, evidently of the colour of the bile contained in the engorged liver. This colouration of the excrement becomes deeper as death approaches. I supposed at first (the natural course of the fluid being intercepted by the ligature) that the bile was absorbed in the liver, and afterwards poured, with the other secretions, into the intestines; but I soon ascertained, beyond all doubt, that the green matter was contained only in the cloaca, where it was brought by the ureters, and that there was no trace of it in the intestines, unless it were in the inferior part of the

rectum, where it had regurgitated. MM. Dumas and Prevost have remarked, that the secretion of bile increased, when that of the urine was interrupted; and in this instance we see the kidneys eliminating the bile, which could not be discharged through its natural outlet, affording a proof of the disposition of the liver and kidneys to act vicariously.

2d. A ligature was placed upon the hepatic duct and artery. Twelve hours afterwards the surface of the liver assumed a yellow tinge, which was in like manner imparted to the adjoining viscera; the branches become engorged, announcing the presence of bile. After the lapse of twenty hours, the liver contained a great number of granules, of a green colour, more numerous in the left lobe than in the right. A green matter was found in the cloaca as in the preceding case. If the life of the animal be prolonged to forty hours, the green colour of the liver and excrement becomes still more intense. These last experiments appear to prove, that the biliary secretion continues, long after the afflux of arterial blood has been cut off.

3d. A ligature was applied upon the artery alone. In this case, the hepatic ducts being unobstructed, no engorgement of the liver followed; but after death, it was ascertained that the secretion had continued, bile being found in the ducts, and the contents of the intestines presenting their natural bilious tint.

4th. In this experiment, the branches of the vena portæ and the hepatic ducts were tied. The liver was almost entirely deprived of colour, presenting only a pale rose tint, not unlike that of the lungs of these birds; there was no trace of bile; the intestines contained only a grayish pulp; the muscular coat of the stomach was of a pale red, and its internal membrane, which is naturally always green or yellow, was colourless. The trunks of the meseraic veins alone were engorged, the branches which were distributed among the intestines no longer admitted blood; a circumstance strongly in contrast with what might have been anticipated from the considerable engorgement which was observed immediately after the operation. Several of the pigeons lived thirty-six hours, but in all the cloaca was filled with excrement, without any tinge of green. If only the principal trunk of the vena portæ be tied, the gastro-hepatic veins being left unobstructed, the right lobe, into which they enter, is found fourteen hours after, in its natural condition, while the left is without colour, and presents upon its surface some traces of bile.

From the preceding experiments, the results of which entirely accord with each other, we may conclude:

1st. That the ligature of the hepatic artery does not prevent the secretion of bile.

2d. That the presence of bile is manifest, when at the same time, the excretory ducts are tied.

3d. It can scarcely be doubted that the elements of this secretion, are derived from the blood of the vena portæ; the ligature of this vessel arresting it altogether.

in such a manner as to render it impossible to distinguish them. I have several times attempted it unsuccessfully."—*Bichat*, p. 45, 1st vol.

From the London Medical and Physical Journal.

ON THE VARIETIES OF CATARACT;
their Causes, Formation, and Cure. By S.
J. STRATFORD, Assistant Surgeon 72d High-
landers.

A great difference of opinion still existing in the minds of the profession respecting the causes and formation of cataract, I have been led, from a variety of circumstances, to pay particular attention to this disease; so that I trust the following observations may be deemed worthy of consideration: they may appear novel, but I hope they will be fully supported by future observation and experience.

To comprehend the nature of cataract, we must have a correct idea of the anatomical structure and formation of the parts concerned: we must attend particularly to the connexion between the lens and its capsule, and have a just conception of the minute, delicate, and transparent tissue by which the lens is held in connexion with life and the animal economy; and, if we pay due attention to its natural and healthy condition, we shall be better able to comprehend and appreciate the varieties of its diseases. I shall, therefore, pass briefly in review the anatomical structure of the lens and its capsule, conceiving that it will the better lead us to understand this disease.

The crystalline lens is that transparent body placed upon the anterior surface of the vitreous humour, imbedded as it were in its substance; it is covered and surrounded by a beautifully transparent capsule, which serves to retain it in its proper situation; we observe that the lens is doubly convex, and that in its posterior surface this is much more marked than in its anterior. The lens is formed by very thin concentric lamellæ, superposed upon each other, increasing in density, and finally surrounding a harder nucleus. The more external layers are soft, and easily removed, but the nearer we approach the centre these become more condensed and firm in their texture: as a necessary consequence of this formation, we find the centre considerably thicker than the circumference. The component parts of the lens, chemically examined, seem to consist principally of albumen and gelatine, with traces of several neutral salts; it is firmly coagulated by boiling, or the action of acids. A fact curious in the formation of the lens is, that by the action of heat it is separated into thin equal divisions: this is the separation of its fibrous texture, and no proof of its muscularity, as was imagined by the ingenious Dr. Younge. The lens is contained in its proper capsule, a thin transparent membrane, which is firmly connected to the surrounding textures. This capsule is described by some anatomists to be formed by a splitting of the external membrane of the vitreous humour; but this would form a lamina so very thin, that it would not be strong enough to confine the lens in its situation, but would be ruptured

by every motion of the globe. Moreover, if we compare the relative density of this membrane with the capsule, we shall find the capsule considerably thicker than the membrane, especially when it approaches the lens, which must at once convince us of the fallacy of such a conclusion. The capsule undoubtedly is a distinct membrane, firmly connected, and surrounded by the adjoining textures. It is strengthened and supported on the fore part by a reflection of the tunica Jacobi, which, having surrounded the proper matter of the nerve, is continued forward, comes in apposition with, and is connected to, the posterior surface of the ciliary processes and external layer of the hyaloid membrane. At a short distance, however, from the capsule of the lens, this membrane separates from the vitreous humour, and, proceeding forwards, is reflected over the capsule of the lens, firmly adhering to it, and serving to keep it in its proper situation; while the outer layer of the hyaloid membrane is situated behind, and, being closely united to it, assists to fix it in its position. Between the adhesion of the tunica Jacobi to the hyaloid membrane and its reflection over the capsule of the lens, we find a cavity denominated the canal of Petit, or, by the French, canal Godronné; this being regularly crossed by little transparent fibres (in all probability, serous arteries and veins,) passing from the union of these membranes to the capsule of the lens, serving to bind down the former tissue at certain intervals; so that, if we open into this cavity, and inflate it by means of a blowpipe, the air passes easily around the capsule of the lens, and elevates the tunica Jacobi at equal distances, forming a kind of crown, having the lens contained in its capsule for the centre. Within the capsule we find a minute quantity of fluid, which surrounds the lens, and is called the liquor Morgagni, which in all probability is to fill out the capsule, and permit the motion of the lens in the adjustment of the eye to near and distant vision: this fluid must be secreted by the inner surface of the capsule.

It has been said that the lens is not supplied with blood-vessels; that it is only a deposition from the liquor Morgagni by which it is surrounded. That this is not the fact, I am convinced; and I am sure I shall be supported by every rational and thinking mind; for, as the lens is formed by an infinite wisdom for a particular and useful purpose, so must it be supplied with vessels which nourish and connect it with the general system, supporting it in that combination of actions which is a proof of its vitality, and even of its existence as a part of the animal frame. As a positive proof, in the healthy eye we find it perfectly transparent; but, when separated from its connexions, it soon becomes opaque, and is then absorbed: this must convince us that it possesses life, and therefore has vessels circulating through it, by which this life is supported. These vessels pass, I believe, (although I cannot positively demonstrate the fact,) from the

capsule to the circumference of the lens, taking their course through the liquor Morgagni, and carrying a perfectly transparent fluid: so minute indeed are they, that they may be ruptured by a blow on the eye, when they leave the lens as a foreign body, similar to what anatomists would have us to believe was its natural condition. The vessels which supply the capsule of the lens I have often seen ramifying on its surface in the living eye during disease: in their natural condition, however, they are perfectly invisible, being minute serous twigs from the arteria centralis retinae. The arteria centralis retinae, having supplied the retina and arrived at the ciliary processes, inosculates freely with the short ciliary arteries, and going forward as serous vessels through the canal of Petit, and by their adhesions causing the roseated appearance already mentioned, they give out minute serous twigs to the membranes forming this canal, while their chief branches go on to supply the capsule of the lens, and even the lens itself: besides these, the twig that passes through the centre of the vitreous humour is finally distributed on that part of the hyaloid membrane which strengthens and supports the posterior part of the capsule of the lens.

In this delicate system of vessels, there must be some which act the part of arteries, conveying and depositing the materials which compose the lens; while again there must be others, which absorb and remove that which has become effete and useless; for it is under this tenure only that the lens can possess life, and form a part of the animal frame.

The uses of the human lens would appear to be similar to the optician's, but it is much more perfect in its construction: it is evidently placed behind the pupil to refract and concentrate the rays of light, so that they impinge with due precision upon the sensible retina, the more essential portion of the organ of vision.

Having thus spoken of the formation of the lens and its capsule, I come to the consideration of the varieties of cataract, which essentially consist in an opacity of the lens, its anterior or posterior capsule, either of which may be separately affected, or all be combined in the same eye. When they are obvious to our sight, they are marked by distinct appearances that seldom or never fail us in our diagnosis.

As a general rule, we may say that an opacity of the anterior capsule is known by its dull white appearance, which something resembles common tissue paper; an opacity of the lens only is marked by its shining surface, which is perceived to be the thin transparent capsule still covering the opacity; and when the posterior capsule only is affected, it takes on a dirty white appearance, and by a practised eye is soon distinguished, from its evident depth of situation. These means of diagnosis will generally serve us, but they will be met with under a great variety of different circumstances, which must be minutely known to enable us to form a correct distinction of the situation of the disease.

The immediate causes of the formation of cataract have long been involved in much obscurity, but, by carefully tracing each variety of the disease from its source, and comparing the several causes and effects, I trust I shall be able to point out on what cause each may depend, which will greatly simplify the description, at the same time that it points out the kind of operation which ought to be used in the cure of these different varieties.

Inflammation is undoubtedly one of the causes of cataract: it may be either acute or chronic, and, with respect to its effect, either complete or partial. When cataract is a consequence of the acute variety, it is always complete; that is, both the lens and capsule have participated in the disease, and have become wholly opaque. This opacity is caused by a deposition of coagulable lymph within their previously transparent tissues: with this we frequently find a closed and permanently contracted pupil, for the most part adhering to the capsule of the lens. This condition of the parts prevents our seeing the peculiarities of the disease; but when the iris is not implicated, or but very partially, in the complaint, we shall observe a dense opaque capsule, which sometimes contains a somewhat enlarged lens. The opaque capsule has the dull white appearance noticed above, which particularly distinguishes it from a lenticular opacity; while, if the lens is enlarged, or there is a greater secretion of the liquor Morgagni, the posterior chamber of the aqueous humour is abolished, the iris sluggish in its actions, and presenting a black mark around its pupillary margin, which is most distinctly seen in a blue eye: this is formed by an eversion of the uvea, or pigment, on the posterior surface of the iris, pushed forward by the increased size of the lens. Sometimes even the iris is pushed out of its position by an enlarged and protruding lens; so that, if the pupil was previously contracted, upon the first application of the belladonna, it becomes largely and permanently dilated, provided it has formed no previous adhesions. The lens has lost its transparency, but we cannot observe it through the morbidly thick and opaque capsule; but, when we come to operate upon it, we shall find that it is not much firmer or harder than the natural structure; a circumstance of very material consideration in the choice of our operation. If any adhesion has taken place between the uvea and capsule of the lens, the application of the belladonna may rupture their connexions, and leave a considerable portion of the pigment adhering to the capsule: this forms a variety of the complaint that has been denominated the *Cataracta Choroidalis*. The acute progress of the disease is marked by all the symptoms of internal inflammation, such as considerable vascularity of the sclerotic coat, pain in the eye and temple, while generally more or less affection of the iris is present. The effusion of lymph into the transparent tissues is so sudden, that we are seldom able to mark the progress of the disease but by its ultimate effect.

The inflammatory action may be chronic, when the opacity will be more or less complete, according to the intensity or duration of the disease. This morbid action, which I have ventured to designate by the term Chronic Inflammation, generally takes its course slowly, without much pain, so that in some cases it does not rouse the attention or excite the fears of our patient. Sometimes, however, very soon after the commencement of the disease, he finds that objects appear indistinct, and, if examined with attention, they seem covered with a mist, or as though he looked through a glass that had been breathed upon; while, at night, the candle appears to have a halo or brim around its flame. These, indeed, are some of the most distinctive marks of incipient opacity in some of the transparent media: they cannot possibly be confounded with disease or insensibility of the optic nerve; for this always presents to the imagination a dark spot, or general deficiency in the power of vision. If we now apply the belladonna so as to dilate the pupil, (which should be an invariable practice, so that we may observe all the peculiarities of the complaint before we pretend to form our judgment of its kind,) the patient will be better able to distinguish objects, from the dilated pupil admitting more of the rays of light to fall upon the retina. The same effect occurs in the evening or a dark day, which is a symptom that would strongly confirm our suspicions of the nature of the disease, even before we recognise an opacity; while, if the disease is in the nervous texture, sight is best in a good light. These symptoms, I imagine, rather indicate an increase in the density of the fluid circulating in the transparent media; but, should the morbid action go on to the deposition of lymph, it soon becomes visible, upon examination of the pupil. Should the disease subside or be diminished by proper remedies, the lymph may again be absorbed; but, should it become organised, the opacity will be permanent. As the disease proceeds, a number of spots, or opacities, will be observed in the pupil, at regular distances, around the circumference. Sometimes we may perceive two sets,—one in the anterior capsule, more white and distinct; the second of a yellowish muddy colour, marking, by the obvious depth of its situation, that its seat is in the posterior capsule. At this time, too, we may frequently see several triangular shaped stripes, that often take on an appearance like mother-of-pearl, or, if more opaque, look like spermaceti when broken across; and, should these striæ become completely opaque, they form the striated Capsular Cataract. These striæ almost always pass from the circumference to the centre; which peculiarity may, perhaps, be accounted for by the manner in which the vessels pass to the supply of the part. When the disease has arrived at this point, it may remain stationary for years; or, if it go on, it may become complete, the capsule being entirely opaque, as marked by its dull white colour. Before the disease, however, has arrived at this extent,

we may observe the lens to put on a bluish white colour, which is more marked in the centre than the circumference, while the partially opaque capsule is evidently seen stretched over it: this by degrees becomes more opaque, but it is generally soon hid from our observation by the dense opacity of the capsule. If at this period we cut up the lens, we shall generally find it of its natural consistency, though in some few instances it may have become harder and rather firm, which, when in situ, is marked by its assuming a darker tint, deeper situated than the capsular opacity; and, if it should become enlarged, it will encroach upon the posterior chamber of the aqueous humor.

I have noticed that the opacity may be partial and remain stationary in the anterior capsule; the same may occur in the posterior, which, as I remarked, is particularly known by its yellowish muddy-white appearance, more or less dense according to the intensity of the disease. It may commence either in the centre or at the circumference, when it takes the form of striæ, which, if carefully examined, may be observed to have a concave shape, evidently (to an eye practised in the observation of these diseases) deeper seated than the lens.

It will, perhaps, be correct here to notice that I have, in several instances, observed opacities evidently deeper seated than the last variety of these diseases: these, I think, may be correctly referred to an opacity in the vitreous humor, which might mislead an inexperienced person with respect to their immediate seat.

Besides the symptoms already mentioned as attending chronic inflammation of the lens and capsule, we shall generally find that there is a greater determination of blood to the eye than usual; and this is especially evident after an examination of the organ. Many distended veins will be seen ramifying in the conjunctiva, while a slight pink-coloured halo surrounds the margin of the cornea; and often the eye is much more irritable than usual.

There is another variety of morbid action producing cataract, much more difficult to understand than the preceding: this always commences in the lens itself, is never observed but in old people, and would seem to be the product of a chronic action bearing some analogy, but evidently differing from the preceding varieties. It is always slow in its progress; so that, when the opacity first commences, the patient experiences the same indistinctness of vision as is mentioned in the foregoing variety: he has the same cloud before the eye, and observes a similar halo around the flame of the candle. The iris commonly acts with freedom, but the pupil is generally dilated, from the diminution of the number of the rays of light that pass through the only partially transparent lens. If we examine the dilated pupil, we soon observe that the lens is of a grayish amber or yellowish colour, more dark at the centre than at the circumference, which obviously depends upon the varied thickness

of the body; and, if the lens only is affected, it has a fine polished surface. As the disease increases, the patient becomes more or less blind, and the lens assumes a darker colour, verging from yellow to a natural brown. Soon after this, we generally observe that the capsule begins to participate in the disease: at first it is but very slightly affected; the lymph is deposited in its texture, it takes on a dotted or variegated appearance, which has sometimes been compared to the white veins of some kinds of marble, and from this circumstance it has been denominated the *Cataracta Marmorata*. As the affection increases, so the capsule becomes more opaque, and in time perfectly obscures the hard lens, so that at this period we may be deceived in the nature and consistency of the cataract. The only points that will assist our diagnosis is the age of our patient, and the commencement of a similar disease in one of his eyes; for this complaint is not often confined to one eye, although it is seldom equally forward in both. The lens, we find upon an operation, is seldom larger than natural, but it is always observed to be considerably harder: this varies with the depth of its colour, which forms an excellent criterion of its consistency. When we examine it after the operation of extraction, we find that its centre nucleus bears a relative proportion to the general texture of the lens, so that, while the circumference is hard and firm, this has in some instances been said to equal bone in the density of its texture. The capsule, too, in the latter stage of the disease, is always much more tough than natural, is perfectly white in its colour, and opaque in its consistence, so that it effectually obscures the hard lens.

There is still another variety of cataract, obviously differing from any of the preceding; it occurs in all ages, while it is most frequently seen in the infant's eye, and is commonly known under the appellation of *Congenital Cataract*. In the commencement of this disease, (if we are so fortunate as to meet with a case,) we may observe that the lens at first presents a bluish white opacity, still covered by its shining capsule. If we watch its progress, we find the lens gradually becomes perfectly opaque and quite white, but from its colour is obviously soft; after a time its capsule is dotted with opacities, or we may observe streaks upon its surface of the dull white colour before mentioned: these increasing, the opacity becomes general, and now we frequently observe that it contains a fluid, which is of different degrees of density; so that, by attentive observation in the pupil largely dilated with belladonna, we can see, if the eye be kept quiet for a time, that the more white and dense particles have subsided, and now occupy the lower margin of the pupil; but, upon the first motion of the ball, they are again mixed in the general mass, and the cataract assumes an equable appearance. This is the *Milky Cataract* of some authors. At this period the capsule is commonly swelled out, as may be known by its effects upon the

iris: this generally continues for a short time, when its size again begins to diminish, and that appearance of the iris to subside; while soon it will be seen to become smaller than before, and we may sometimes observe a dark ring around its circumference, evidently not produced by the everted margin of the iris, but depending upon the collapsed state of the capsule, permitting the rays of light to pass between it and the ciliary processes, and bringing to view the dark choroid coat through the transparent vitreous humour. The iris now may sometimes appear to have a vacillating motion, dependent upon the loss of support which the containing membrane of the eyeball experiences upon the removal of the lens from its natural situation; for at this period the lens is almost entirely absorbed, so that it leaves but a thin scale, or perhaps but its original centre nucleus: even this, however, in time is removed, and the anterior lamina of the capsule retires upon the posterior, until approximated they seem to form but one membrane, perfectly opaque, white, and elastic: the *Cataracta Arida Siliquosa* of authors.

Nobody, having just ideas of the anatomy, can contemplate the progress of this disease without at once recognising cause and effect; and if, in the congenital variety, any doubt should still exist, we have but to reflect upon the cause and termination of that cataract, sometimes produced by a blow upon the eyeball, or a rupture of the capsule permitting the escape of the lens, to be convinced of the fact. Indeed, if we examine the eye after death, and observe with what facility the lens starts from its capsule, we may perhaps be able duly to appreciate the tensivity of those vessels that form its connexion with the capsule; and then, if we see how easily the lens escapes, we must at once perceive how slight must be that concussion which will break through these vessels, and how they may be broken without the capsule being opened. Should the lens then be separated from the living body, it is dead; becomes a source of irritation, though still enveloped in its capsule, and in process of time will be absorbed. I think I may say, then, that this variety of cataract always arises from a blow upon the eyeball, a sudden concussion, or unusual pressure, that acts upon the part so as to rupture the vessels that support the life of the lens; for, when this occurs, the lens gradually becomes opaque, and, as a foreign body, produces a degree of irritation upon the inner surface of the capsule, and lymph is deposited; while an increased secretion of the liquor Morgagni also takes place. The vessels that deposit the lymph upon the capsule may sometimes be seen by the naked eye: at first it is laid down but partially, and only at certain points, which causes a spotted appearance. The lens now begins to dissolve in the liquor Morgagni, and is slowly absorbed with that fluid. Soon after this the capsule becomes wholly opaque, but still it is evidently swelled out by an increased secretion of the liquor Morgagni: this projection, however, decreas-

es as that fluid, and the lens dissolved in it, is absorbed; and, when it is entirely removed, and the laminae of the capsule have collapsed upon each other, (in the infant eye,) we may perceive the black rim around its circumference. This, I believe, is caused by the capsule not increasing in size (now the lens is removed) in proportion with the rest of the eye, so that it remains stationary, while the vitreous humor and ciliary processes are fully developed.

From observation, I am led to believe that this is the most frequent cause of congenital cataract; the *Cataracta Centralis*, as recorded by authors, may sometimes occur; but this will depend upon partial inflammation of the capsule. I have observed the common variety of congenital cataract to follow tedious labours, in which the frontal bones, at this period of life separated into two portions, may experience a compression; they may even collapse over each other; when the pressure must affect the globe, and may rupture the vessels of the lens.

On referring to M. Demour's work upon the Diseases of the Eye, I am happy to find that I am supported by so excellent an authority; for he precisely states, that "*Si on veut réfléchir attentivement à la structure du cristallin, à son esollement dans sa capsule, à la petite quantité de lymph, ou humeur de Morgagni, qui l'environne et à la nature de son enveloppe, ou expliquera aisément les phénomènes qui présente cette maladie pendent et après sa formation, tout medecin que réfléchira attentivement à la structure du globe de l'œil, trouvera quelque soit alors le système adopté pour expliquer la nutrition du cristallin, qui l'interruption de cette nutrition est la cause immédiate de la cataracte.*"

"Les causes externes de la cataracte sont connues: les blessures qui entament la capsule de cristallin; les *percussions qui détruisent la circulation dans ces parties si délicates; en un mot, tout ce qui put changer les rapport du cristallin dans le globe détruisent sa transparence.*"

That this proceeding is the common process of congenital cataract, is also strongly corroborated by the opinions and observations of Saunders and Gibson; while their discrepancy of opinion may now be easily explained, by considering that they must have seen their patients at various periods, when different and distinct stages were present.

The cataract produced by a wound of the eye and a rupture of the capsule, with an escape of the lens, differs but little from that just noticed: it undergoes similar stages; the lens first becomes opaque, which commences immediately after it is separated from the capsule, and in a few days it is quite white; the capsule also is inflamed, and lymph is deposited on it; it becomes white, and in the end assumes the character of the coriaceous cataract.

By way of recapitulation, then, I think I shall be supported in considering that cataract may be caused—

1st. By acute inflammation of the lens and capsule.

2dly. By chronic inflammation, for the most part beginning in the capsule of the lens.

3dly. A morbid action commencing in the lens itself.

4thly. By a rupture of the vessels which connect the lens with the capsule, and endow it with the principle of life.

5thly. By a rupture of the capsule and escape of the lens.

These varieties of disease will obviously require different operations for their cure. Cataract caused by acute inflammation of the lens and capsule should always be cut up with the needle, and left to the process of absorption for its removal. That produced by chronic inflammation should experience a similar treatment. The third variety, in its very commencement, should undergo the operation of reclination or depression; but in its latter stage, when it has become hard, even should it be enveloped in a tough capsule, ought to be extracted; for the hard lens almost invariably causes so much irritation, that glaucoma is a consequence of its presence in the eyeball after it is depressed. The fourth or fifth varieties, by their progress, point out that we have but to separate the diseased portions from the living system by means of the needle, when the absorbents will entirely remove them from the organ of vision, and hereby cure the disease.

From the Nouvelle Bibliotheque Medicale.

CASE OF PLEURITIS, FOLLOWED BY SUPPURATION; and Evacuation of the Pus through the Lungs, and Intercostal Muscles. By M. ROQUES.

A man aged 30 years, of a lymphatic temperament, was attacked in consequence of exposure to a stream of cold air, with acute pain in the right breast—cough without expectoration, &c. He was twice bled from the arm the following day, and fifteen leeches were applied to the breast, which were productive of considerable relief. The third day, the pain had almost entirely disappeared, but returned again toward evening in the posterior part of the same side. Fifteen leeches were applied to the seat of the pain. The fourth day the cough had abated, but was still unaccompanied with expectoration, pulse slightly frequent, decubitus upon the left side, less painful than before; the integuments over the inflamed part were tumefied, and acutely sensible to the touch; the lancinating pain in the breast became more severe towards evening. On the fifth, he was attacked with accute pain in the right knee, with inability to flex the member. A blister was applied, which discharged abundantly; a tumour was observed in the part of the chest above indicated. For several days, there were alternations of pain between the tumour of the back and knee; according to the report of a health officer, he was almost entirely free from fever. The preceding im-

perfect detail of symptoms was communicated to M. Roques, when he visited the patient on the sixteenth day of his illness.

In the evening of that day, he had fallen down in a state of suffocation, and M. Roques was accordingly sent for in great haste; when he arrived, he found his patient expectorating purulent matter in considerable quantity; he was in a sitting posture, leaning forward, in which situation, respiration could be performed without pain; in every other it suddenly became extremely difficult. No distinct diagnostic could be drawn from the sound produced by percussion, by reason of the thickness and flabbiness of the adipose tissue; it was rather more obscure, laterally on the right side, than on the corresponding part of the left; pulse seventy-five, intermittent, countenance greatly dejected, tongue covered with a whitish mucus in the centre. The tumour on the posterior part of the chest was of an oval form, and situated over the most projecting part of the ribs; its vertical diameter was about six inches, and half that extent transversely; the skin preserved its natural colour; a deep seated fluctuation was perceptible in the centre of the tumour; the ear applied immediately above the tumour, perceived an unusual cavernous sound, which the patient stated he had heard for the last three days. On pressing the centre of the tumour, a noise was produced like that occasioned by the passage of fluid into the chest, and M. Roques no longer doubted, the existence of a communication between the abscess and bronchiæ, the patient having expectorated three or four spoonfuls of pus, the source of which appeared to be seated beneath the hand applied over the tumour. An opening was made into the tumour, followed by a greater hæmorrhage than usual on such occasions, and a discharge in considerable quantity of well concocted pus, exactly resembling that expectorated; its evacuation was promoted by moderate pressure; after which a tent was introduced into the opening, and a compress and bandages applied. The intermissions in the pulse, were observed to be of less duration than they previously were.

The knee was much enlarged, unattended with change of colour; and not unlike the tumour known by the name of white swelling; it could be handled without occasioning any great degree of pain, but this instantly became very acute, upon any attempt at flexion. 17th day. The patient passed a sleepless night, sitting in his bed, and much incommoded by the cough; he had expectorated about an ounce of pus, less yellow than before; a considerable quantity similar to that of the preceding day, was discharged from the tumour. The centre of the latter, appeared to be elevated when the patient made a deep inspiration. A noise resembling that occasioned by air passing through a liquid, was discovered by the stethoscope applied over this part; but the most remarkable phenomenon, was the intensity of the sound, when the patient made a deep inspiration, not unlike that made by

children with a pasteboard tube, in form of a trumpet. The respiratory murmur was heard less distinctly on the affected side, than on the other.

The knee continued acutely painful, with a sensation of heat, imperceptible to the hand. Six leeches were directed to be applied, followed by an emollient cataplasm; he had been placed the preceding day upon a rigid diet, decoction of barley with oxymel, and the same treatment was still enjoined, with the avoidance of every thing stimulating.

The night of the 18th was calm, and the patient enjoyed some hours of sleep; the cough and expectoration were diminished; there was some tendency to syncope; about two spoonfuls of pus were discharged by the tumour, which was much contracted; a deep inspiration elevated its parietes, and several globules of air escaped with the pus. The exertions in coughing excited a transitory pain, beneath the right breast, the part first affected with inflammation. A more nutritious diet was directed, and a spoonful of wine three times a day.

Nothing very remarkable occurred up to the 24th. The tendency to syncope left him; the discharge of pus from the wound having ceased, and the expectoration become more copious, with increased frequency of pulse, and other symptoms of febrile irritation, an incision was made into the centre of the tumour, above the former one, and carried through the first layer of muscles, it did not penetrate however, into the cavity of the abscess. The knee continued painful as before, and but for the diffusion, and uncircumscribed form of the swelling, might have been supposed a case of dropsy of the joint. A cavernous sound was still heard through the stethoscope, applied over the situation of the dorsal tumour. An infusion of gentian and some other tonic medicines were directed.

The symptoms continued with little alteration to the thirty second day, from which period the amendment was progressive. The quantity of pus expectorated diminished daily, and was thrown up more easily, the sonorousness of the chest was observed equally on both sides, and the knee became less painful, and more susceptible of motion, though it still preserved the appearance of a white swelling. Irritated some days later, in consequence of imprudent exercise, the pain and swelling reappeared, but gradually yielded to appropriate applications, and the patient ultimately recovered, without any farther accident.

From the London Medical and Physical Journal.

CASES OF COMPOUND FRACTURE OF THE SKULL, WITH DEPRESSION. With Observations by B. TRAVERS, F.R.S.

Case 1.—October 20th, 1827, William Clark, æt. thirteen, was brought into St. Bartholomew's Hospital, at eight P. M. in a state of stupor from a severe blow with a staff flung from a height, which had produced a radiated

fracture of the left parietal bone, with depression. His pulse was small and irregular; skin cold; breathing hurried; frequent contractions of the muscles of the face and right arm; pupils moderately dilated, contracting feebly to the light; and much writhing of the body while the head was examined. The scalp wounds were dilated and joined, and four portions of depressed bone removed. Another large portion not detached was raised to the surrounding level, and a space equal to about two inches of the dura mater lay exposed.

He lost a few ounces of blood from the arm on the same night and succeeding day, and his bowels were kept gently open by castor-oil. On the 22d, (third day,) his pulse was 140, and he was disposed to coma, with oppression of the chest, and complained of pain in the head. These symptoms yielded to a dozen leeches applied to his temples, and motions obtained by castor-oil and a clyster. On the 25th, (sixth day,) he was convalescent.

After some days he had a smart attack of diffused inflammation of the connecting cellular tissue of the scalp and occipito-frontalis muscle, with much soreness and tumefaction on the opposite side of the head, and accompanied with fever. Twenty leeches were applied, and afterwards a cold lotion. He took a solution of salts with liq. antimon. tartar., and the part recovered without suppuration; since which his progress to health has been uninterrupted.

Case 2.—November 10th, 1827, John Williams, aged thirteen, was admitted into St. Bartholomew's Hospital, about noon, with a severe injury of the head from the falling of a wall after a fire. He was perfectly rational, and had no symptoms of mischief to the brain, but a feeble pulse of sixty, and a cold surface.

A lacerated wound of the scalp near the posterior extremity of the sagittal suture on the right side of the cranium was dilated, and discovered a fracture extending from the suture, near its junction with lambdoidal, across the parietal bone. The sagittal suture was loosened, and, at some distance from the former transverse section, another, commencing at the suture, took a diagonal direction. The triangular portion of bone included was driven in, and so wedged as to require the removal of a small portion of contiguous bone for the application of the elevator. A free venous hemorrhage occurred, which was checked by applying a dossil of lint. He lost rapidly near a pint of blood, and it was apprehended that the sinus was wounded. In the evening he was found quiet. His pulse had risen, he was sensible, and not complaining of pain, but disposed to sleep. In the morning he was heavy to sleep, having passed the night in that state without restlessness. He was perfectly sensible when spoken to, but unwilling to be roused; his pulse feeble, and intermitting occasionally. He had passed urine, and rejected a dose of castor-oil.

At two o'clock, the same state, drowsy, but rational; some blood had issued from the wound. The bowels had not acted, and four grains of calomel and a common clyster were

directed. These procured copious relief from the bowels.

Between five and six he expired, with little, if any, change of symptoms.

On examination, the exposed dura mater was found discoloured, and also a small wound in that membrane connected with a vein of the pia mater near its entrance into the longitudinal sinus, from which the hemorrhage had proceeded. The veins of the corresponding space of the pia mater were loaded, so as to give it a thickened appearance. The cortical substance was marked with specks of extravasation opposite the injury. Otherwise the brain was natural, firm, and healthy.

Case 3.—November 10th, 1827, Stephen Briffet, æt. twelve, was brought in along with the former, having received a similar injury at the same time and place. He had been stunned, but was now recovered. The skin, however, was chilled, pulse small, and breathing slow. A flap wound of the scalp over the left parietal bone, near its upper and posterior angle, exposed a fracture; and, after a farther dilatation of the exposed integument, a central portion of the bone, of the diameter of an inch, was observed to be insulated, and driven down upon the brain. From this a fissure extended towards the sagittal suture. The depressed piece was raised by forceps, without the aid of the trephine or saw. In addition to bruises, there was also a lacerated wound of the eyelids of the left eye at the external angle of the orbit, which had detached them and penetrated the conjunctiva, so as to lay open the orbit on this side of the bottom. In the evening, the boy was as well as could be desired, faculties perfect, and skin warm, with a moderate and soft pulse.

On the third day, having passed a restless night, his appearance and manner became altered. He was very restless, tossing about constantly, and complained of a pain in his head. The pupils of the eyes were dilated. The bowels having been opened, and the stomach rejecting medicine, forty drops of laudanum were injected in a clyster, and retained. This procured him five hours of sound sleep; but he continued to get worse, and died on the night of the 16th.

Examination.—A boundary of adhesive matter, corresponding to the fractured and denuded bone, was seen upon the dura mater, after raising the vault of the cranium. This membrane was sound. On raising it, the general appearance of this hemisphere was paler than that of the opposite side; the vessels of the pia mater being in a state of emptiness. The cerebral substance, on the contrary, exhibited very numerous red specks on section, and the cineritious substance opposite the injury was preternaturally loaded with blood. The chambers and basis of the brain were natural, but its substance soft.

Observations.—In all these cases the symptoms were those of commotion. In the first case there was evidence of pressure also, and of its relief by the operation, in the state of the senses, the breathing, the pulse, the pupils,

&c. as compared before and after the operation. But the recurrence of similar symptoms on the third day, as well as the character of those first displayed, does not admit of this being entirely referred to the displacement and pressure of the fractured bone: it was like the greater number of these incidents, a mixed case.

Whilst Mr. Travers was hesitating to operate upon Williams, the second case, it was observed that a circular piece of bone was apparently missing; but, upon gently dropping the probe through the aperture, it struck upon the surface of the displaced bone, and the apprehension of consequences from its complete impaction beneath the cranium determined him to proceed. It was by this piece that the dura mater had been torn, and, as the event proved, there would have been less risk in allowing it to remain; for it is probable that the boy's death was accelerated, under the existing circumstances, by the free hemorrhage from the pia matral vein.

Both these lads, Williams and Briffet, had been stunned, and laboured under the effects of severe physical shock or concussion. They were passively intelligent, pale, cold, with a small and feeble circulation. There was nothing in the symptoms that pointed to the head as the seat of the injury. Their state was undistinguishable from that which we see every day produced by injuries of parts remote from the brain. Nevertheless they were in process of gradual recovery from the effects of a direct concussion of the brain, which an hour before had deprived them of sense and motion. The boy Clark (No. 1,) had been stunned to insensibility, and remained stupid, tossing his arms about, and moaning when disturbed for examination. He also was pale and cold; his pulse feeble and intermittent; he had rejected the contents of his stomach; his breathing was oppressed, not stertorous; pupils dilated, but not motionless. The relief following the operation in his case was marked and immediate.

The mode of injury by which a concussion is inflicted must influence not only the degree, but the character of the mischief. The singleness and purity of the concussion, or its combination with compression, creates a marked distinction. The nature of a concussion, as of a fracture, is probably determined by the more diffused or circumscribed operation of the force by which it has been inflicted. Clark (No. 1,) was struck with a rail, or piece of wood, flung from a loft. Williams and Briffet were buried under the ruins of a falling wall.

Modern experiments have shown the difference in the effects (upon the organs which maintain life) of an injury which wounds or divides, and one which crushes or breaks down the structure of the brain or spinal marrow; between the wound or removal of a part, and the disorganization of the mass. It would appear that the effects of a severe concussion are entailed upon the injury from the moment of its infliction, although the immediate symptoms of disturbance sometimes recede, and an interval of comparative tranquillity succeeds

to it. For where no lesion of the brain or its membranes, nor any inflammatory action, has existed, how otherwise can we explain the recurrence of symptoms similar in character to those which mark the first stage,—that is, of purely nervous symptoms, after a period of three or more days, and their speedily fatal termination,—but by supposing a deeper and more universal injury to the nervous mass than was at first apprehended. The extraordinary frequency and conspicuousness of the red points, upon section of the medullary substance of the brain, Mr. Travers noticed repeatedly, contrasted with the empty state of the vessels upon the membranes, in cases in which the symptoms of shock had prevailed, both consequent upon and unconnected with injury of the head. A congested state of the capillary arteries to so considerable a degree as to render many conspicuous, which in a healthy brain are invisible, is a phenomenon opposed to that actually presented in fatal determinations to the head, in which the veins of the membrane are loaded, that in this are pale and collapsed. This congestion of the cerebral circulation in the arterial capillaries, or at least colourless vessels, must be gradual, and unlike that which happens in the general circulation at the moment of death. It is probably an effect of the impaired tone of the nervous structure, but it must exercise in turn a most extended influence on the actions of that system, and the functions of life. This, and the tendency to serous effusion, commonly regarded as the signs of inflammation, are the most notable appearances met with after death from concussion. Dr. Wilson Philip, in his chapter on serous apoplexy, (inquiry into the laws of the vital functions, p. 311,) has some interesting observations tending to show the analogy in the symptoms of concussion and of serous apoplexy, as contradistinguished to those, likewise analogous, of sanguineous apoplexy and compression. The depleting treatment cannot be borne in the former, which the latter calls for. Inflammation is equally remote from both.

Mr. Travers makes this observation as a caution to his juniors in the profession, against the premature employment of the lancet in concussion,—that is, before the circulation has completely recovered itself, or rather before the commencement of an action decidedly inflammatory. It is curious to observe how blindly the notion has been acted upon, which has been so generally and energetically impressed. The quantity of blood which a man can afford to part with in a given number of hours, is commonly exemplified by reference to cases of inflammation of the brain. Now, concussion and inflammation have unfortunately been identified, and lives have as undoubtedly been lost in the former, as saved in the latter, by the lancet. The reporters of the cases speak of a cold and pallid surface, and a sunken pulse, and its further sinking under the lancet, and their fear to proceed, in the same paragraph. Day after day, however, it has been resumed, as if in obedience to an

abstract principle, and it is stated as matter of regret that only four or six ounces, instead of eight or twelve, as ordered, could be obtained at the last bleeding.

In most cases of concussion, the following treatment will, Mr. Travers thinks, be found most suitable. To relieve congestion, and no more, leech bleedings, and lax, not fretted, bowels: he prefers calomel or castor-oil, as the case requires, and the domestic clyster;—cold lotion to the shaved scalp, blisters to the occiput or nape of the neck; stimulant enemata, as of turpentine and assafoetida, if there be stupor and drowsiness; and if vigilance, tremours, and delirium, with a stomach too irritable to retain medicine, opiate clysters. The effect of both these remedies is excellent in the states described.

Cases of mixed symptoms are more frequent than such as admit of no mistake. In their descriptions, authors have displayed a regard for more exact and positive distinctions than nature commonly exemplifies. To give a system-like simplicity and an oracular tone to their directions, they have introduced diagnostics which are seldom seen and still seldomer to be relied on. Take concussion and compression for example. The most frequent case is that in which the symptoms of commotion and pressure are so far blended as to make it doubtful whether, if not depending upon, they are not at least maintained by the displaced portion of the bone. In a consultation, one party decides that it would be most prudent to elevate the depressed piece immediately, because, when inflammation is set up, and the symptoms become urgent, he considers that the operation aggravates the injury, and quickens the fatal event. The other questions this fact, and prefers to take the chance of the symptoms subsiding by abstinence, depletion, &c. Now, which of these parties is right? Thus far the question was tried under the observation of Mr. Travers, many years ago, at Guy's Hospital. Two boys were admitted, patients of the same surgeon, with compound fracture of the skull and depression. Neither had any symptoms of compressed brain, and consequently no operation was practised. After some days one of them was attacked with symptoms of inflammation, and the depressed bone was elevated. The symptoms were not in any degree mitigated, and the boy died. In the other the operation, which had been hitherto postponed, was now performed, and he did well. He might, however, have done as well had he been let alone, no symptoms having occurred; and the narrative therefore only shows, what we were predisposed to believe, that, where inflammation of the membrane follows upon depression, the operation is of no avail. Inflammation of the dura mater is a consequence of depression; but, if the parts be undisturbed, it may be limited to the spot, and the membrane be preserved from suppurating and spoiling. Mr. Travers would consider the advantage of being before hand with the inflammation,—the many facts to prove that depression is by no means an irrecoverable

condition,—the probability that if it be so inconsiderable as not to produce symptoms in the commencement, it may be prevented from afterwards doing so,—as full and sufficient grounds for declining the operation in all cases in which no real symptoms of compression presented themselves. On the other hand, the symptoms of compression being present, the operation, in his judgment, should be resorted to, whether the scalp were wounded or not. Thus Mr. Travers would make the presence of symptoms of compression, *cæteris paribus*, the criterion by which to determine the fitness of the operation; and the more marked the symptoms, the more indispensable the operation. And when, as in the case supposed, the symptoms are of a mixed nature, (and they are never absolutely separable,) we must be guided according to the predominance of either, being in mind that, in proportion as pure concussion prevails, any operation is objectionable.

From the Edinburgh Medical and Surgical Journal.

1. *Exposé des Divers Procédés, &c.*—Account of the different methods employed to the present time to cure Stone, without having recourse to the operation of Lithotomy. By J. LEROY, (D'ETIOLLE,) M. D. Paris 1825.
2. *Remarques sur l'Uretré, &c.*—Remarks on the Urethra, Male and Female. By M. AMUSSAT. *Archives Generales*, Tome iv. January, 1824.
3. *De la Lithotritie, &c.*—On Lithotrity, or Destruction of Stone within the Urinary Bladder. By Dr. CIVIALE. With five plates. Paris, 1827, 8vo. pp. 254.
4. *Rapport, &c.*—Report presented to the Royal Academy of Sciences, by MM. CHAUSSIER and PERCY, on the method proposed by Dr. Civiale for destroying Stone, without having recourse to Lithotomy. Paris, 1824.
5. *Memoire sur la Lithotritie, &c.*—Memoir on Lithotrity. By ALPHONSO TAVERNIER, D. M. P. (*Journal des Progres des Sciences et Institutions Medicales en Europe, en Amerique, &c.* Vol. II. Paris, 1827.)

It is by no means wonderful that at all periods of the history of the healing art, it has been a favourite problem to discover some means of removing urinary concretions, less formidable than that of lithotomy. The pain, the danger, and the uncertain result of all incisions made into the urinary bladder, are sufficient to invest every form of the operation with more or less terror, and make it be viewed at all times by the patient, if not by the operator, with that feeling of uncertainty, from which none but a very ignorant or a very indifferent person is wholly exempt. Though the surgeon may look to the operation of lithotomy, with that alacrity and pride which spring from a conscious sense of the triumph of his art, to the patient it appears as the only alternative of a life of pain and misery, and the only probable mode of removing a disease which in some instances is worse than many deaths.

The first proposal by which the evils, real or supposed, of the surgical operation were attempted to be avoided was that of medicines, which were confidently called lithontriptic. This idea, however, which originated in ignorance, not only of chemical, but of physiological laws, was, after many futile and unavailing trials, abandoned as erroneous. It is needless now to revive the history of the argument, the ridicule, the invective, and the irony, with which the reputation and the memory of the unhappy Mrs. Stephens were alternately assailed. These were the days neither of Black nor Lavoisier; and if the calcined egg-shells and Alicant soap did no other good, they led Whytt and others to the notion of lime-water, and the whole train of alkaline remedies. The system has been simplified, and the theory has been rendered intelligible; but at the present day the efficacy of the alkaline remedies is maintained by Sir Gilbert Blane, Mr. Brande, the late Dr. Marcet, and Dr. Prout.

As the great objection to this hypothesis consisted in the fact, that no lithontriptic of sufficient strength to operate on a stone in the bladder, could be conveyed into the stomach without more or less injury to that organ, and that in such a form as not to affect the stomach, it must be inadequate to operate on the urinary concretion, and was liable to decomposition. To obviate this objection, it was proposed to convey the lithontriptic medicines directly into the bladder. The practicability of this method, which was understood to have been originally suggested by Hales, was maintained in 1742, by Makousky of Königsberg, and demonstrated in 1746 by Browne Langrish on brute animals,* and about ten years after by William Butter on the human subject.† The latter gentleman, then a clerk in the Royal Infirmary of this city, injected lithontriptic solutions into the bladders of two patients, labouring under symptoms of stone in that establishment, in the presence of Dr. Whytt, and published a description of the apparatus which he conceived most suitable for the purpose. No further account, however, was given of the results of these injections; and the practice appears to have been left to languish in neglect, till revived under happier auspices by Fourcroy and Vauquelin in 1791. These distinguished chemists, detailed in the second volume of the *Memoirs of the Medical Society of Emulation*, the particulars of several cases in which they tried various injections. From these trials, and from the recent testimony of Marcet, who had also put it

* *Physical Experiments upon Brutes*, in order to discover a safe and easy method of dissolving the stone in the bladder by injections, &c. Read before the Royal Society. By Browne Langrish, of the College of Physicians, and F. R. S. London, 1746.

† A method of cure for the stone chiefly by injections. With descriptions and delineations of instruments contrived for these purposes. By William Butter, M. C. Edinburgh, 1754.

in practice, it must be admitted that the method by injection, possesses the merit of being more consistent with the laws of chemical action than the former. It has not, however, been free from considerable difficulties, which have tended to keep it rather in the place of a scientific curiosity, than in that of a practical and useful measure susceptible of general application. Even the continued injections by the means of the double tube imagined by Hales,* and afterwards realized by Gruithuisen,† though recently applied by the ingenuity of Magendie, have not afforded results perfectly successful.‡

In short, the method is beset with difficulties so considerable, as to render its general adoption as a surgical remedy, exceedingly improbable. The necessity of obtaining accurate information on the nature of the concretion, and of accommodating the solvent to the substance to be dissolved, is indispensable to its success, and even to its innocence; and this is by no means easy even to chemists, and very difficult to ordinary practitioners. It is further to be remarked, that no fact is better ascertained than that the saline, or earthy matter deposited from the urine, varies at different periods in the same individual; and that in the same concretion three or four different kinds of substance may be found. Lastly, even supposing the case to be simplified by the removal of these difficulties, the operation of injection requires to be so frequently repeated, and so long continued, before any material impression is made on the concretion, that few patients can be found who have sufficient firmness and patience to persevere with a process which, conducted with the utmost caution, is attended with more or less irritation of the urinary passages.

An application of chemical agency, still more elegant and ingenious, originated with M. Bouvier Desmortiers, who first conceived the possibility of dissolving urinary concretions by the decomposing influence of galvanism. This happy idea was adopted by Gruithuisen, who in 1813 undertook to prove its practicability in regard to concretions out of the bladder. The experiments which he made led him to infer that almost no concretion resists the action of a pile of 300 plates, which have the effect of forming deep holes in its substance; and he advises in the case of a hard calculus to employ 600 plates, when it would be dissolved with remarkable rapidity.

This method of destruction was in 1823 more completely investigated by MM. Prevost and Dumas. They first subjected a fusible calculus out of the body to the operation of a pile of 120 plates, which was charged afresh every hour; and they found that a concretion, which at the commencement of the experiment weighed ninety-two grains, was reduced in twelve hours to eighty grains. In sixteen hours more it was so friable that on the slight-

* *Hemastatics*, p. 175. † Saltzburg, Zeitung, 1813.

‡ Leroy, *Exposé*, &c. p. 96.

est pressure it fell into crystalline grains, the largest of which did not equal the size of a lentile. In a second experiment, performed on the fragment of a concretion introduced into the bladder of a living dog, in the course of six hours they rendered very friable, and deprived it of much of its weight, without apparently causing the animal much pain.

By M. Leroy the apparatus employed by MM. Prevost and Dumas is believed to labour under some disadvantages, especially in the conducting wires being retained irregularly in contact with the concretion. This inconvenience he proposes to obviate by first grasping the stone by an instrument analogous to what he terms the *lithoprion*, and having entirely or partially perforated it thus secured by connecting one wire with its surface, and the other with the hole in the centre; the stone, assailed in this manner at two points, must speedily give way; while the bladder cannot be injured by the galvanic current, which is totally expended on the concretion. The suggestion is certainly highly ingenious; and as by its scientific precision it obviates the principal objection to which the galvanic method of decomposition is liable, it has a just title to more extensive trial than it has yet undergone.

A third mode of obviating the alleged evils of cutting into the bladder to extract a stone, is that of mechanical destruction or division into fragments so minute that they may be expelled through the urethra. At first sight this proposal seems the most impracticable of any, and calculated to be little more than the pastime of ingenious but chimerical speculators. The narrowness and unyielding nature of the male urethra, its length, its curvature, and the delicacy of the textures of which it consists, all present obstacles at first sight utterly insuperable,—*first*, to the division of such a substance within the bladder as a urinary concretion; and, *secondly*, to the extraction of the fragments by the urethra without serious, if not irreparable injury to that canal.

Such are the thoughts of preconception unregulated by the knowledge of actual facts, and the results of accurate experiments. Difficult and chimerical as the proposal may appear, it has actually been realized; and if there be truth in human testimony, it cannot be denied that stones have been so much divided and broken by mechanical contrivance within the bladder, as to be extracted through the urethra not only without injury, but with comparative ease.

The merits of originality in contriving this method of removing urinary concretions from the human bladder is claimed by different individuals. It would be foreign to our purpose to enter into the question of the rights of either of the claimants; nor do we propose to espouse the cause of any one of them. The general merits of the contrivance, admitting its utility and practicability to be equally great as they represent it, are very much divided. It is enough to say, that all seem to be agreed that to M. Amussat belongs the chief merit of urging and demonstrating, at

least at present, from accurate knowledge of the structure and configuration of the urethra, the practicability of using the necessary instruments. M. Leroy again appears to have been best acquainted with the history of the operation, to have known most accurately what had been imagined and executed in all that relates to the extraction of vesical calculi, without recurring to cystotomy, and to have proceeded on the most rational plan for rendering the method one of experience and practicability. Lastly, the name of M. Civiale is still most closely connected with the actual performance of the operation, several, we believe now many, examples of which he has successfully accomplished on the living subject.

After these preliminary remarks, we proceed to take a short view of the steps by which this operation of destroying calculi within the bladder has been gradually brought to its present state; and to consider briefly the different methods by which the object is believed to be most readily and expeditiously attained.

The removal of concretions from the male bladder without recurring to incisions implies three conditions. The first is, that the urethra be susceptible of a certain degree of dilatation. The second, that the stone, or fragments of stone, be very small; in other words, that it be reduced to minute portions. And, with a view to the accomplishment of this effect, the third condition is, that the direction of the urethra admit of the introduction of instruments adequate to divide the concretion if necessary, and to facilitate the expulsion of its fragments through the canal.

It is unnecessary to advert to the spontaneous escape of concretions from the bladder through the female urethra. That fact is so well established by cases recorded by various authors, more especially by Bartholin, Borelli, Kerkringius, Grunewald, Morand, and those given by Drs. Wallis, Gardner, Beard, Molyneux, and Leprotti, in the *Philosophical Transactions*, that it is equally impossible to doubt it, and superfluous to undertake its demonstration. It is well known that upon the knowledge of this fact depends the method originally practised by Stromani and Franco,* revived by Tolet,† and Bromfield,‡ and repeatedly performed of late years by Sir Astley Cooper§ and others,|| of extracting calculi from the female bladder by dilating the short and distensible urethra by the introduction of spongetents and similar mechanical contrivances.

Very different is the case with regard to the urethra of the male; and the spontaneous

* *Traité tres ample des Hermes*, p. 143.

† *Traité de la Lithotomie*.

‡ *Surgical Observations and Cases*.

§ *Medico-Chirurgical Transactions*, London, Vol. viii. p. 433.

|| Drs. Hamilton and Ramsay in *Medico-Chirurgical Transactions*, Edinburgh, Vol. ii. and Dr. Mackintosh in *Med. and Surgical Journal*, Vol. xxiv.

escape of concretions by this canal is of infinitely less frequent occurrence. Instances, however, even of this event have occasionally happened; and all who are acquainted with the history of vesical surgery, or are conversant with its practice, are well aware of cases of this description. Almost every collection, public and private, contains many examples of minute calculi, more or less numerous, which have been discharged under favourable circumstances by the urethra; and most practical surgeons have met with cases in which patients continued during many years to expel calculi through that canal from the bladder.

These facts, together with the operation of the steel sound, are sufficient to show that the male urethra is dilatable to a certain degree. M. Leroy states five lines to be a diameter attained with difficulty, and thinks that he is justified in inferring that many men can with difficulty support sounds of this size. This statement may be correct in reference to the vesical extremity and the prostatic portion of the canal; but in other parts it is certainly more dilatable, at least in the average of well-sized healthy adults. The steel sound marked No. 14, we find to be exactly five lines in diameter, and not only this but No. 15 we have repeatedly introduced in the adult male, and others have done the same. Upon this point we expected to find some exact information in the essay of M. Amussat; but that gentleman has been more solicitous to establish the flexible nature of the male urethra than to ascertain to what extent it was dilatable.

But previous even to the lights afforded by correct anatomical science, the dilatability of the male urethra appears to have been believed, if not demonstrated. We have the evidence of Prosper Alpinus to show, that among the Egyptians in the sixteenth century,* it was an ordinary practice to distend the urethra with air, in order to extract urinary concretions. The same writer states that he witnessed an Arabian physician extract in this manner calculi as large as olives, or even small nuts.† At a much later period in Europe, it appears from the writings of Meckren and Helwig, that the method of mechanical dilatation was successfully practised for the same purpose.

It is nevertheless well established, that beyond a certain point the male urethra cannot be dilated; and hence, in several of the instances in which calculi are recorded to have been detruded from the bladder into the urethra, they have stuck fast in the canal until removed by art. This accident appears to have been noticed at an early period; for we find in the writings of Albucasis, Hildanus, Ambrose Paré, and others of the older surgeons, frequent mention of cases in which it was requisite to extract the stone from the urethra, and minute

descriptions of instruments and mechanical contrivances for effecting this object successfully.

"But if a stone stop," says Paré, "in the end of the *glans*, it must be plucked out with some crooked instrument; to which, if it will not yield, a gimblet, with a pipe or case thereunto, shall be put into the passage of the yard, and so it shall be gotten out, or else broken to pieces by the turning or twining about of the gimblet, which I remember divers times to have attempted and done; for such gimblets are made with sharp screws, like ordinary gimblets."*

That the operation of Paré was afterwards practised by Daniel Fischer, of Kesmark, we learn from his son Charles Daniel, who has left an account of the method in which his father operated. This surgeon, whose aid was requested to relieve a Hungarian counsellor of noble rank from the sufferings occasioned by a concretion impacted in the urethra, having caused a steel canula containing a piercer to be constructed, not to break but to perforate the calculus, introduced this instrument, moistened with almond oil, to the concretion, which he secured by holding the urethra with his left hand. When he satisfied himself that the canula was applied to the surface of the stone, he introduced his piercer and proceeded to work it until the concretion was thoroughly perforated. This being accomplished, the piercer was withdrawn, and a pair of long-beaked small forceps was introduced so accurately as to enter the hole made in the calculus. The handles of this instrument being then separated, the stone was accurately broken in four pieces, which were voided when the patient made water with little pain; *exiguo cum dolore*; and the counsellor was henceforward completely delivered from this evil without any injury of the urethra, *absque omni læsione urethræ*.†

We give this case as a good example of ingenuity in surgical operation, and to show that the idea of lithotrixy, at least in the urethra, is by no means new; and we believe that few will dispute that the operation of Fischer is a valuable improvement of the method of Ambrose Paré.

This operation nevertheless, does not appear to have been since repeated; and surgeons have been contented to employ forceps, pliers, and hooks, for the purpose of extracting stones from the urethra, or to facilitate the operation of these means by the use of bougies and mechanical dilatation. The former was the method conceived by Hales, and practised by

* Alpinus tells Guilandinus that he sailed for Cairo in 1580, and left Egypt in 1584. *De Medecina Egyptiorum*, libri iv. lib. i. x.

† Ibid. lib. iii. chap. 14.

* The works of that famous chirurgion Ambrose Parey, London, 1634, Lib. 17, chapter xxxix.

† *Dissertatio Medico-Chirurg. de Calculo Vesicæ Urinarie in Urethram impulso et singulari Encheiresi, absque sectione exempto. Quam palam tuebatur Carolus Daniel Fischer, Kesmarkkia-Hungarus, 1744. Haller, Disp. Chir. Tom. iv.*

Ranby, Lamotte, Hunter, Desault, and other surgeons. By means of the latter, Boyer succeeded in extracting four calculi of good size from the urethra of a man of sixty years.*

Of the same practice a variety still more advanced is that of extracting small calculi from the bladder through the entire length of the urethra. This method, the merit of which has been generally given to Sanctorius, has not, however, been much followed. Sir Astley Cooper alone several years ago removed in this manner from the bladder of one patient not fewer than eighty-four concretions of the size of garden peas.† The instrument used by this dexterous surgeon was a pair of two bladed bullet-forceps, made to open when in the bladder, by means of a stilette, so as to grasp and confine the stone during extraction.

When the disease consists of numerous small stones, it is obvious that the chance of their expulsion from time to time, or even their extraction, is much increased. The expulsion of one stone exceeding a certain size is an anatomical impossibility; and the first difficulty to be surmounted in the removal of such a concretion is its size. To divide it therefore, or break it down by mechanical means, is the most obvious method of attaining the object; but how to affect this through such a narrow canal as the urethra, was the point which appears to have perplexed all those who investigated this subject, and most powerfully called for the exertion of their ingenuity.

In meditating on these difficulties, we have a good example of what has occurred more than once in the history of the healing art. We allude to the circumstance, that a measure, from the adoption of which a professional person regularly educated, impressed, as he imagines, with the principles and reasons of all his practical proceedings, and understanding, as he conceives, their dangers, difficulties, and practicabilities, would shrink in despair, recoil with indignation, or turn with absolute contempt, is not unfrequently confidently undertaken, and successfully accomplished by one utterly ignorant of the supposed principles, utterly unaware of the imagined dangers, and in all probability completely incapable of comprehending the alleged practicability. The operation of breaking down a stone within the bladder was first performed, so far as testimony goes, by an ecclesiastic of Citeaux, and a military officer of the East India Company's service.

The latter case, that of Colonel Martin, Dr. Monro, the present Professor of Anatomy in the University of Edinburgh, used to relate to his pupils as an instance of a method of curing stone without cutting into the bladder,—singular in its nature, and therefore worthy to be known, but though practicable,

neither very expedient nor likely to be repeated. In alluding to this fact, the reporter speaks as if its statement required to be clearer, and its date more distinctly fixed, in order to establish his title to priority. We pledge our personal testimony for it so long ago as 1813; and the case had then been related much oftener than the first time, so that the professor is as much entitled to the merit of the method of lithotrity as any of the present competitors. The case has since been published in the Journal of the Royal Bombay Institution, and again in the 2d edition of the work of Dr. Marcet, in either of which works an account may be read. The method used by Colonel Martin was by introducing through the urethra a steel sound, the extremity of which was sharpened like a file. For an authentic account of this we refer to another department of this number.

To this case the authors of the report on the work of M. Civiale have added one which appears to have occurred at a still earlier period. A monk of Citeaux in Normandy is said to have cured himself of stone by introducing into his bladder a flexible catheter, through which he caused a long straight piece of steel, terminating like a chisel, to move. When the end of this was brought against the stone, he struck smart blows on the other end with a hammer, and thus succeeded in detaching minute portions of the calculus, which, when voided, were preserved for the inspection of the curious. The authority on which this narrative rests, is not mentioned; and we must avow our ignorance of its original source.

The practicability of the method of lithotrity was thus demonstrated empirically long before its merits were examined, or its principles were investigated by surgeons.

An important element in any scheme of this description is to ascertain the practicability of breaking down a concretion within the bladder by instruments introduced through the urethra. Though not absolutely impossible, it may be attended with such difficulties and inconveniences as to render it inexpedient; and this itself may constitute a serious objection to the lithotritic method. It is manifest, that, in the case of hard concretions, such, for instance, as consist chiefly of lithic acid, of phosphate of lime, or of oxalate of lime, the difficulty of dividing them mechanically is much augmented. In the softer species again, especially the fusible calculus, which is friable, and the ammoniaco-magnesian phosphate, which is always less compact than the three first mentioned, division by instruments must be comparatively easy, and of short duration.

It is well ascertained that some urinary concretions have fallen down spontaneously into fragments within the bladder; and various examples of soft or friable calculi are recorded or alluded to in the annals of vesical surgery. Barbette stated long ago that he had more than once met with calculi so soft, that he was persuaded he could have broken them even with the sound in the neck of the blad-

* *Traité des Maladies Chirurgicales*, &c. Tome ix. p. 318.

† *Medico-Chirurgical Transactions*, Vol. xi. p. 349, 357.

der.* Heister, in the *Philosophical Transactions*, (No. 417, p. 13,) describes a case in which 100 pieces of broken calculi were at different times voided through the urethra. And Detharding† has recorded an instance of fragments of a calculus being voided for many weeks. Lastly, it is well known to those conversant in surgical operations, that in several instances in which lithotomy has been performed, the concretion has been so friable as to break down between the blades of the forceps, and increase greatly the labour of the operator in extracting them.

While these facts show the difficulty of the method of lithotomy in some instances, they demonstrate its practicability in others. If it can be ascertained that the stone consists either entirely or chiefly of the fusible matter, (triple phosphate and phosphate of lime,) or of the triple phosphate, or even of the cystic oxide, it may be very easily broken down into small portions.

To Gruithuisen, the Bavarian physician, above-mentioned, is ascribed the merit of conceiving this mode of operating, and of contriving an instrumental apparatus for effecting it. This physician commenced his proposals by demonstrating not only the practicability but the facility of introducing straight sounds through the urethra into the bladder. In two individuals he introduced, without difficulty, glass cylinders rounded at the ends, and from three to four lines in diameter. He afterwards, to obviate the objections of the incredulous, performed the same operation on a man of thirty, in the presence of Counsellor Mussinau, Professor Kaurk, and other competent judges.‡

The point of straight catheterism being established, Gruithuisen proceeded to describe his lithotritic apparatus, which consists of a silver canula enclosing a double wire loop for clasping and holding the stone, and a sharp piercer or stone-drill, which, being made to revolve on its axis by means of a bow, is made to perforate the part of the stone to which it is applied. In some instances he proposed to vary this instrument by substituting the crown of a small sized trepan.

The method now mentioned is with some justice censured by M. Leroy, who regards it as too dangerous a mode of dividing or comminuting the stone. It is certainly a mode both rude and hazardous, in so far as a wire noose, not very accurately fitted, is much too insecure a means of retaining a concretion upon which a perforating instrument is operating within the bladder. He acknowledges, however, that to Gruithuisen is due the merit of opening the path to this new mode of operating.

* "Se tam mollem sæpius invenisse vesicæ calculum ut etiam vel solo cathetere in collo vesicæ conterere potuerit."—*Chirurgia*, p. i. c. 76.

† *Dissertatio Medico-Chirurgica de Calculo Vesicæ Friabili*. Apud Haller, *Disput. Chirurg.* Tom. iv.

‡ *Salzburg Zeitung*, 1813.

It is a remarkable proof of the ignorance in which at certain times one part of the world remains of the proceedings of the others, that this proposal of Gruithuisen seems to have been completely unknown in France, and if known in this country, no proof of such knowledge ever was given. This at all events may be inferred from the fact, that the next proposal of this description is that of Mr. Elderton, originally published in this *Journal*, Vol. xv. This contrivance, for the account of which we refer to its proper place, is admitted by M. Leroy to show that its author perceived the practicability of lithotomy, but is still objectionable from the insecure mode in which the concretion is proposed to be held.

Previous even to this period, according to the statement of the report, that is, in July, 1818, M. Civiale had applied to the minister of the interior for pecuniary advances to defray the expense of constructing instruments, which he conceived would be adequate to destroy urinary concretions within the bladder without recurring to cystotomy. This application was some days after referred to the Faculty of Medicine, with a memoir explaining the instrumental apparatus, which, even at this stage of the business, he had denominated *lithonriptor*. On the 14th of the same month the society appointed to M. Civiale the same commissioners who were latterly given him. But at this period no report was made, and the matter remained stationary.

The following year, however, 1819, the lithonriptic apparatus was constructed by a mechanician of Paris, with the modifications and amendments which it possessed at the date of the report. The invention of the instrument, therefore, described and employed by M. Civiale, is assigned to that gentleman exclusively by Baron Percy and M. Chaussier, the authors of the report. Admitting the ingenuity and originality of the method of the Bavarian physician, they consider it, nevertheless, vague and incoherent; and they assign to M. Civiale the first place for the happy manner in which he has established, explained, and put in practice a proposal little more than sketched in a foreign journal.

The first step which appears to have occurred to M. Civiale at this period, was the possibility of introducing a straight sound, or catheter into the bladder. Baron Percy remarks, that De La Stène, in studying the anatomical peculiarities of the urethra, had recognised that this tortuous but extensible canal might be made to follow several directions, and become even rectilinear under the use of a sound of this shape. The experiments of Gruithuisen, and the instrument of Elderton already mentioned, were equally unknown. Meanwhile, M. Amussat, who openly claims priority on this point, had, from his intimate knowledge of the disposition, direction, and capabilities of the male urethra, been in the habit of employing straight catheters previous to 1818. We have already, on a former occasion, mentioned this surgeon and the peculiarities of his method; and it is superflu-

ous at present to do more than merely refer to the article in which his name is introduced.* Though we are aware that some experiments on this point had been performed in London by Mr. Stanley, teacher of anatomy, yet we cannot speak positively as to the exact date, whether it be previous or subsequent to that at which M. Amussat had established the fact. It cannot be denied, on the whole, that to the latter belongs the merit of clearly demonstrating the fact, and acting on its knowledge in his operations on the bladder and urethra. He has in short rediscovered the method practised by Gruithuisen.

In returning to M. Civiale, we now find him interfering somewhat with the claims of M. Leroy. It appears to be quite undetermined whether the former gentleman had also established, by his own researches, the possibility of introducing a straight catheter, or had derived this from M. Amussat. According to the statement of M. Leroy it appears, that while M. Amussat was led by his employment of the straight sound to contrive a stone-breaking instrument, M. Leroy, pursuing this discovery of M. A., had also effected a similar invention. M. Leroy, however, it must not be forgotten, connects the announcement of M. Amussat of the practicability of using the straight catheter with the month of April, 1822, a date nearly four years posterior to the time when this anatomist is said to have first established the fact, and three years posterior to the time when M. Civiale is said to have constructed his lithotritic instruments.

These circumstances render it difficult to decide the question of priority as to the invention of the *brise-pierre*; and perhaps, though important to the individuals concerned, it is of no great moment to the surgical world at large. The fact is certain, that both M. Leroy and M. Civiale have contrived apparatus adequate to break down urinary concretions within the bladder; and this is, probably, all that it is important for the world at large to know. For a fuller view of this debated point we refer the reader to the elaborate paper of M. Travernier. We come now to consider the comparative merits of the methods in use, and to examine how far they are calculated to attain the end in view.

The principal instrument devised by M. Leroy is what he terms the *lithoprion* or stone-saw, (*λίθος lapis* and *πριων serra*;) of which he has two forms,—the simple lithoprion, and the lithoprion pincers. The essential part of the former is a steel rod, to one end of which are attached two small saws, mutually diverging by means of a spring, and the toothed edges of which look in opposite directions. This instrument is to be introduced through a silver canula, which is enclosed within another canula, in the interval between which are contained four pieces of watch-spring, so arranged that when introduced into the bladder, they start out and embrace the concretion,

which is thus maintained immoveable. When the stone is thus secured, a long drill is introduced through the inner canula, and by working it upon the stone, a hole is drilled as nearly as may be through the centre. This being completed the drill is withdrawn, and the lithoprion is introduced in its place, and, being inserted into the perforation made by the drill, is wrought in the interior of the stone, until the latter is either entirely divided or easily gives way.

With this apparatus M. Leroy made many trials on the dead subject, and two of these publicly. Each time the stone was seized and perforated without causing any injury to the bladder; and the experiment was carried no further, since the stone, which consisted of oxalate of lime, was large and very hard, would have taken too much time to be entirely broken, and because in the dead body the absence of sensibility must have rendered the operation the same from the beginning to the end.

The resemblance between the lithoprion of M. Leroy and the instrument of Gruithuisen in general principle is obvious. It must be admitted, nevertheless, that the steel-spring-case affords a much more secure method of clasp- ing the stone and preventing injury from the drill than the wire loop of the latter author.

Some physicians thought they could trace an analogy between the lithoprion and the *vesical* of Franco, or the ball-screw of Alphonso Ferri. Though M. Leroy contends that there is a great difference between it and these instruments, he has not disdained to imitate the principle of the ball-screw in constructing what he denominates the lithoprion pincers or forceps. He also admits the resemblance of this instrument to the three-fanged pincers of Sanctorius. It consists of a steel canula terminating in three tempered fangs, which are made to separate naturally. By sliding this into a silver canula these fangs are made to approach mutually, in order to be introduced through the urethra into the bladder, when, by moving the steel canula according to the indications of a scale attached, they may be separated to any degree till they grasp the stone. Their concave surface is armed with filing or sawing teeth; and by withdrawing the steel canula a little they are brought to clasp the surface of the concretion. A hole being drilled in the centre of the stone as before, a bifid drill is introduced and carried through the perforation; and by giving this a rotatory motion, either the stone is carried round, while the surface is rasped by the lithoprion forceps, or if these grasp it too firmly to admit of this motion, the central hole is enlarged, until the stone is reduced to a thin shell, which at length breaks into fragments.

Such is the apparatus of M. Leroy, and its mode of operation. The details regarding the mode of procedure, and the rules to be observed, are also given; but these the imagination of the reader will easily supply.

Of the apparatus *peculiar* to M. Civiale it is not so easy to obtain a distinct account. At

* Medical and Surgical Journal, Vol. xxiv. p. 172.

first his object was to dilate the urethra, to introduce into the bladder a straight instrument, in order to perforate the calculus, and to enclose it in a sac containing a solvent liquor to effect the solution, as well as the mechanical division of the stone. With this view he constructed an instrument furnished with a pouch or sac, and forceps with four arms, carrying in its interior a sort of drill, which was made to revolve by the fingers. This second instrument, termed indifferently *lithonriptor*, *lithoprione*, or *saxifrage*, was constructed of two hollow metallic cylinders, one of which was inserted within the other, and the end of which was furnished with four or more diverging branches kept apart by their own elasticity. Their inner surface, nearly flat, was smooth in the two posterior thirds, but armed with teeth in the rest. The opposite end of this cylinder was marked with lines to indicate the degree of divergence of the arms when the instrument is in the bladder. It was fixed to the outer tube by means of a screw attached to the latter. Through the inner cylinder was introduced a steel stilette, the anterior extremity of which is pyramidal, with acute angles or flat, but armed with teeth like those of a saw; and by giving this a rotatory motion the concretion was to be perforated or ultimately broken.

The first part of this apparatus, the pouch instrument, is clumsy and inconvenient, if not impracticable in application. The second part, the lithonriptic instrument, is better, but is nevertheless so imperfect, that we believe it has since been relinquished by its author; or at least it has undergone changes so great that it can no longer be viewed as the same instrument.

Thus to the blades of his lithonriptor, which were formerly flat, he has given a degree of curvature, so as to form a concave receptacle for the concretion. He has armed them all over with teeth, so as to operate on the stone at all the points of contact. And lastly, he has given the drilling stilette a more energetic and rapid rotatory motion, by subjecting it to the action of a bow or a hand-drill. In short, the instrument now used by M. Civiale is as near as may be the latter instrument, or the lithoprion forceps of M. Leroy.

These several forms of lithonriptic apparatus have been more or less modified and improved, according to the views of individual operators. Of these the most distinguished are M. Heurteloup and M. Merieu, who have effected, in the construction of the instruments, some rather beneficial changes, by which the operation is certainly both simplified, rendered less dangerous, and made considerably easier. Into the details, however, of these changes, we have not leisure to enter.

The operation of lithotripsy itself has been divided by those who practise it into three stages. The first is that in which the straight instrument is introduced, and the calculus is seized and secured. The second is that employed in perforating, rasping, and breaking it down. To the third they have allotted the

business of extracting the fragments from the bladder.

In the different modes of proceeding by Leroy, Amussat, Civiale, Heurteloup, and Merieu, the principle of securing the stone is much the same. That of M. Heurteloup, as described by Tavernier, appears to be the most efficient. Like the others, it consists of a four-bladed forceps, placed in the interval between two silver tubes, one of which is inserted within the other. That of M. Merieu is distinguished first in the two tubes being made of steel, in the inner one being incomplete its whole length, and split into five portions, which form so many blades of forceps, while the deficiency is supplied by two other plates, which are made to form the sixth blade; and secondly, in his lithonriptic instrument or stone-file being made to act at once in the centre and on the circumference of the concretion.

The destruction of the stone is effected in all the methods, first, by drilling a hole in the centre, as nearly as it is possible to conjecture, of the concretion; secondly, by enlarging this in various modes.

To effect this M. Leroy introduces the bifid rasp closed into the perforation, after which, by withdrawing the canula, the arms are allowed to diverge. The canula is then secured by means of the screw, and the instrument is subjected to the rotatory motion by the hand-drill. When the bifid rasp has thus enlarged the opening as much as the divergence of its limbs admits, a simple rasp, supported by an elastic stalk, is introduced, and moved in the same manner; and successively other rasps may be used till the operator is satisfied that the stone is reduced almost to a shell.

In the method of M. Merieu, when the concretion is seized, the stone-file *le lithorineur* (*λίθος λίπης πυρήνιμα*,) an instrument consisting of a central piercer and two files placed at the same angle to it, is made to revolve by means of the hand-drill, and while a hole is drilled in the centre, a spherical segment all round is removed from the surface of the stone.

In the method of M. Heurteloup, when the concretion is perforated, an instrument termed a *scoop*, armed with a serrated plate, is introduced into the perforation; and by the rotatory motion communicated to it, while the obliquity of its direction is by particular mechanism constantly increased, as the destruction of the stone proceeds, it acts from the centre to the circumference until the stone is reduced to a mere shell, and is broken with facility.

In the method of M. Amussat, after the perforation is completed by the first drill, its place is supplied by another, which is bifid, and the two arms of which, armed with cutting edges, are separable to any given extent by a simple mechanism. The handle being applied, the rotatory motion is continued until the operator feels that it no longer grates the hard matter of the stone, when the arms of the bifid drill are again to be separated. The rotation is

resumed until so much of the stone has been grated that the sound again becomes faint or ceases, when the arms of the drill are once more to be separated, and the same course continued. When the stone thus grated from the centre to the circumference has become very thin, if it does not give way at once by the repetition of the drilling, it is to be seized with the stone-breaker, (*brise-pierre*) and crushed between its toothed blades.

The mode of removing the fragments is similar in all. The mere powder is carried off by the urine, or by injections of watery demulcent fluids. Small fragments are extracted by such contrivances as the forceps of Hunter; and if fragments too large for this are still left, a second division is necessary.

In addition to the instruments of the surgeons above mentioned, Mr. Weiss of London, whom we have had occasion to mention more than once as an ingenious artist, has contrived a lithontriptic instrument; and Mr. Lukens of Philadelphia has in like manner constructed for the same purpose what is there termed a *lithokonion*, a description of which is given by Dr. Horner in the Philadelphia Journal, (Vol. i.)

It is rarely possible to destroy a urinary concretion by the first attack, whatever be the method employed, more especially if the stone is hard, if it exceeds an inch in diameter, and if the patient is irritable. M. Civiale does not detain his patient much beyond ten minutes. The number of times which the operation requires to be repeated varies according to the size and the consistence of the stone, the wearing which it causes to the instrument employed, and upon the state of the patient. Equally variable are the intervals between the operations. M. Civiale believes it may be repeated at a space varying from the third to the fifth day.

It would doubtless be very desirable if this repetition of the operation could be entirely superseded, and if a concretion of any size could be completely reduced to fragments at a single sitting. A hope of this description is held out by some of the apparatus employed, especially by that of M. Merieu. But whatever power and efficacy be given the instruments employed, it is manifest that nothing but actual experiment can determine the length of time during which the necessary apparatus can be retained in the urethra without injury to that canal, or the neck of the bladder itself.

The report of Baron Percy contains the details of three cases, in which M. Civiale destroyed and removed entirely urinary concretions within the human bladder, in the presence not only of the reporters, but other eminent physicians and surgeons of the French metropolis. Among others the reader recognises the names of Larrey, Giraudy, Magendie, Sedillot, Serres, Nauche, and Souberbielle,—sufficient testimony to the authenticity of the facts. A brief outline of these cases may be interesting to the reader.

In the first case a young man of thirty-two,

proved to have in his bladder a large hard stone, by sounding in the presence of the reporters, and Larrey, Giraudy, and others, was the subject of operation on the 15th January, 1824. The moment the bow was put in motion all present heard a grating noise, which was at once ascribed to the hardness of the mulberry calculus, (oxalate of lime.) The operator allowed a respite thrice to the patient, who felt rather constraint than actual pain. After forty minutes the patient descended from the bed, and with a little urine voided the water injected, and discharged numerous fragments of the concretion, which was supposed to be diminished one-third. On the 23d the operation was repeated in the presence of the reporters and MM. Magendie, Serres, and Aumat; and again on the 3d of February, when after considerable quantity of powdery matter and fragments was discharged, the patient was ascertained to be free of the stone.

The second case was that of a man from Rheims, whose bladder was ascertained to contain a concretion, the nucleus of which was known to be a garden bean. From the sounding, which was performed in the presence of the reporters and Souberbielle, a well known and accomplished lithotomist, the concretion was judged to be soft and about the size of a chesnut. On the 4th of February the instruments were introduced, and the stone seized. The sound heard was dull and occasionally obscure. The bladder, however, being very irritable, the operation was abridged; and the application of leeches and the injection of emollient liquors were deemed expedient. The result was the discharge of several friable portions of stone and much earthy sediment. The operation was repeated on the 7th, with the effect of causing the discharge of some portions of divided concretion, and two or three little masses of viscid animal matter. At a third operation on the 10th, the forceps seized something not very large and somewhat compressible, which proved to be the bean stripped of its earthy crust, and presenting a rostellum as if germinating. Some days after the husk of the bean was clasped by the forceps and extracted; and a last fragment, the presence of which was ascertained by the accurate sounding of M. Souberbielle, was easily removed by M. Civiale by means of the forceps of Hunter.

In the third case, a young Parisian was on the 2d of March ascertained in the presence of the reporters, M. Souberbielle, and other surgeons, to have a stone about the size of a pigeon's egg. Its consistence was moderate; and it was seized and perforated with facility. On the 5th, when it was again attempted, it could not be found, and the meeting was abortive. On the 18th, when the third attempt was made to introduce the instrument, to find and secure the concretion, to grate it and reduce a large part of it, was the business of some moments only. Small grains of gravel and much fine sand, like cutler's powder, were discharged with the urine and injected fluids. By the long forceps of Hunter three or four

parcels of viscid mucus enveloping calcareous grains, were extracted; and the complete cure was regarded as very near.

These cases demonstrate the facility and the practicability of the lithotritic method in males under ordinary circumstances; and with those in which both M. Civiale and others have since successfully operated, they must be held to be good and sufficient evidence of the general utility of the method as a substitute for the formidable and too often uncertain operation of cystotomy. In females the lithotritic method will be still more easy than men, were not the method by dilatation of the urethra almost equally practicable and advantageous.

It must not, nevertheless, be denied, that cases of calculus in the bladder may be attended with circumstances which render the method of lithotrity inadmissible, and even impossible, while that of cystotomy may be indicated. Thus, if the stone is very large, it may exceed the grasp of such an instrument as can be introduced through the urethra. When the concretion is contained either entirely or partially in a cyst, or in a sac of the bladder, the use of the lithotritic method will be equally unavailing. *Lastly*, concretions deposited on metallic substances, for instance a needle or bodkin, a leaden bullet, or the point of a sword, as has sometimes happened; a button, a tooth-pick, or an ear-pick of gold, ivory, or bone, &c. cannot be conveniently destroyed in this mode. If a concretion were known to be deposited on a bodkin or a needle, it might be so far destroyed that the nucleus could be seized longitudinally, and extracted by the urethra. This, however, implies a concurrence of circumstances so singular, that it is almost impossible to imagine the mere possibility. In the case of a concretion formed on a musket bullet, or the point of a broken sword, it is manifest that the operation is quite indispensable.

From the Gazette de Sante.

CYSTOTOMY ABOVE THE PUBIS.

In a communication made to the Académie de Medecine, M. Amussat, after indicating the circumstances which may render inexpedient the operation of lithotrity; such as the great magnitude of the stone; the extreme youth of the patient; the morbid condition of the bladder, kidneys, etc.; declares, that in all such cases, the operation above the pubis should be preferred. From his anatomical researches, he has been led to the conclusion, that the usual method of preparing the bladder and rectum, in order to form a judgment of the direction of the urinary canal, has been productive of error, and has retarded the progress of surgery in relation to catheterism, and the possibility of destroying a stone in the bladder;—he has demonstrated that a bladder distended with air, has a different form and position, from the same receptacle, filled with a fluid. It is upon these considerations, that his new operation is founded.

The bladder, in a state of vacuity, is conceal-

ed behind the ossa pubis, and fills exactly the depression, formed by the projection of these bones anteriorly; it has the form of a flattened cone, the base of which is below and the apex above; its posterior portion is in contact with its anterior, and it presents, towards the rectum, a concavity analogous to that formed by the ossa pubis. This disposition is determined by the peritoneum, and the pressure of the small intestines. The apex of the bladder rarely rises higher than the upper margin of the bones of the pubis, so that its anterior surface is in contact with the whole extent of the symphysis.

Its conical, or rather triangular form, arises from the disposition of the urachus and ureters. In order to ascertain that the bladder does not entirely return upon itself, as in animals, it is only necessary to divide the symphysis upon an entire body, and it will then be seen, that this fortunate disposition of parts, is singularly favourable to the operation above the pubis.

M. Amussat divides the operation into six principal stages. In the first instance, warm water is injected into the bladder—it is not necessary to give to this viscus, the proper degree of tension, that it be distended as was formerly done by frere Côme,—the quantity of fluid which it habitually contains will be quite sufficient, and even in this case, the patient is frequently tormented by the desire of urination. An assistant grasps the penis, to prevent the discharge of the fluid.

In the second stage he makes an incision through the integuments, in the direction of the linea alba, about three fingers breadth in length, and then penetrates the latter, immediately above the pubis, to an extent capable of admitting one finger only.

The third stage, consists in plunging a bistoury into the bladder, guided by the index finger; the bistoury is then withdrawn, and the finger bent in such a manner as to suspend the organ.

In the fourth stage, he explores the bladder with the finger, enlarges the opening in that viscus, and in the linea alba if it be deemed necessary, places the stone in the grasp of the forceps, and finishes the extraction in withdrawing his finger.

The introduction of a large curved canula, by the inferior angle of the wound, in order to give exit to the urine, makes the fifth stage. The sixth consists in affecting union by the first intention, of all that portion of the wound situated above the canula; for which purpose he makes use of adhesive straps, graduated compresses, and a bandage round the body.

Called to Poitiers, in October last, to perform a single operation of this kind, M. Amussat relates that it was practised upon four other persons, a detail of whose cases is contained in his communication to the Academy.

Of these five persons in whom lithotrity was impracticable, three were old men, and the two others, very young children. All were entirely cured, notwithstanding their unfavourable condition at the time of its performance.

The first was a physician at Neuville, 65 years of age, of a strong constitution, but much exhausted by the severity of his sufferings; he was very desirous of avoiding the operation, but the magnitude of the calculus, and the condition of the bladder, precluded all idea of lithotomy. The operation was performed, 29th October, 1827, in presence of a great number of physicians, and a large stone, of the form and size of a kidney, was removed. Examining the bladder with the finger, subsequently to the extraction, a small tubercle was observed near its neck, which was removed by the aid of long, curved scissors, blunted at their extremities. M. Amussat has contrived an instrument of this kind, purposely for the extirpation of excrescences of the bladder and uterus.

A curved canula was afterwards introduced into the bladder, through the wound, which was united by the first intention, above that instrument. The dressings were removed on the fifth day, and the opening occupied by the canula was all that remained. A canula of smaller calibre was introduced on the eighth, and two days after, this also, was discontinued. Urine flowed from the urethra, on the evening of the twelfth day after the operation, and by the twenty-second, the wound had entirely cicatrized.

After a detail of the four other cases, M. Amussat makes some observations upon the importance of the canula; affording at all times a free passage to the urine, and the mucous secretion from the bladder; it has also the advantage of promoting union by the first intention, and of forming, in its course, a fistulous passage, which removes all danger of extravasation. The two first persons operated upon, carefully maintained a horizontal posture; the canula was removed on the seventh day, and the cure completed about the twenty-second, without the slightest unpleasant symptom.

Two of the patients, one 76, and the other 4 years of age, were, on the contrary, indocile, and presented nearly all the symptoms which are observed when the canula is not employed. In these cases the wound remained long open, and its lips assumed a dark, unfavourable aspect; the febrile action, also, ran higher, and for several days apprehensions were entertained respecting the event.

The fifth patient, a child of two years of age, was confined to the bed in such a manner, that it was incapable of the slightest motion; as in the two first cases, the wound united by the first intention, and the track of the canula soon became fistulous, rendering it unnecessary to introduce a catheter through the urethra, as was done in the other instances; its presence, in this case, would have occasioned great pain, without corresponding utility.

Independently of the numerous facts in support of his opinion, recorded by various authors, M. Amussat observes, that it may be inferred from the five preceding cases, that the most important object, after the operation, is to prevent the passage of urine by the

wound, and thus avoid the consequences following the extravasation of this destructive fluid.

From the *Lancet*.

DEEP-SEATED INFLAMMATION OF THE ORBIT, AND PROTRUSION OF THE EYEBALL; *Morbid growth behind the Globe, and destructive Inflammation of the Eye; Extirpation of the Orbital Contents.*

John Banting, ætat. 30, was admitted into Henry's Ward, April 4th, 1827, under the care of Mr. Lawrence. He came from Brighton, in an open cart in one of the coldest days in January, and suffered severely in the journey; his left arm and leg were quite benumbed, so that he could not move them, and he did not recover the use of them for three or four days. At the same time he experienced pain in the left eye; in about a fortnight after his journey from Brighton, the eyelids swelled, and the lower lid at the same time became everted, and the conjunctiva between it and the globe swelled up, according to the patient's description, like a bladder. He had distracting pain in the eye and whole side of the head, and was in constant agony night and day, so that he got no rest until he was completely exhausted by suffering. During this time he was cupped in the left temple, had leeches applied about the eye six or eight times, and had the head shaved and blistered, with only partial and temporary relief. The sight became imperfect a month before his admission into the Hospital, when he came under the care of Mr. Vincent, who punctured the tumid conjunctiva, without giving issue to any matter. Mr. Vincent requested the opinion of Mr. Lawrence on the case, and, after consultation on it, expressed his desire that Mr. Lawrence would take charge of the patient.

April 4. The eye-ball is pushed forwards, and a little upwards, projecting, by comparison with the other, about three-fourths of an inch. The upper lid, which is slightly inflamed, is protruded in an equal degree; the patient is unable to elevate it, and it cannot be drawn up sufficiently to expose the cornea without difficulty. The lower lid is everted by a considerable swelling of the conjunctiva, which is red, and loaded with serous effusion. This swelling has existed from the beginning of the affection; the patient says that it was then larger, and appeared like a bladder of water. The redness extends to that portion of the conjunctiva which covers the lower part of the globe. The rest of the conjunctiva oculi having its natural paleness. No change is observable in the globe; the iris moves freely, but vision is very imperfect; he cannot see even large letters. A firm swelling, without any fluctuation, is obscurely felt within the inferior margin of the orbit; there is still considerable pain, although much less than before. Mr. Lawrence considered it to be a case of abscess deeply seated in the orbit; the severe pain indicated acute inflammation

and suppuration, the tumefaction accompanying such an affection would cause displacement of the globe, and the latter would account for the imperfection of vision. In conformity with this opinion, Mr. Lawrence made a puncture through the skin at the lower and outer part of the orbit, carrying a double edged knife more than an inch deep, in the situation of the firm swelling, and moving it laterally with some freedom; no pus followed. Bread poultice; opening medicine daily; milk diet.

10. The wound began to discharge pus copiously three days after the puncture, and that discharge continues; a probe passes in, to the depth of one inch and a half. The pain is quite removed; the tension of the globe and the swelling of the lids lessened, and the sight improved.

28. There is a continued copious discharge of matter; the upper lid can be elevated, so as to expose the cornea: he can read small print. Remaining nearly in the same state, he left the Hospital on the 3d of May, and attended occasionally, that the progress of the case might be observed. After some time, the eye became rather painful, and he was re-admitted on the 25th of May.

The partial protrusion of the globe, the red œdematous swelling of the conjunctiva, and the purulent discharge from the puncture, remain as when he left the Hospital. A probe passes into the opening about two inches, and can be moved in different directions. Pressure on the eyeball forces out matter from the puncture. There is a firm swelling below the edge of the orbit, leading to a suspicion that the antrum is affected; the cheek and left half of the lip feel benumbed. Leeches have been applied two or three times, and a poultice is continued. He takes aperient and alterative medicines. On carefully examining the part with a probe, bare bone was found at the bottom of the orbit, and the patient then began to have discharge of matter into the left nostril; since that, he found in blowing his nose, that air was forcibly expelled through the puncture, and he shows the fact without trouble or uneasiness.

August 6. Since the last date, the puncture under the lower eyelid has closed; there has been occasional discharge of matter into the nostril. He has suffered considerably from pain behind the orbit, and on the side of the head, the inflammatory symptoms in the part being rather increased. For these, leeches have been several times applied, generally with temporary benefit. A fortnight ago, a fresh and deep puncture was made into the orbit, just behind the external canthus; there had been a previous increase of swelling and redness about the eye, with great constant pain, and a rather deep-seated hardness was felt, in which, however, no fluctuation could be distinguished. This puncture, in making which the instrument was carried nearly two inches deep, went into the cavity formerly exposed; a few small granules passed out with

the blood, but no distinct matter. Air passes out of the opening on blowing the nose, as it did in the former case; the probe goes deep into the orbit, and bare bone can be felt with it towards the lower part. A tolerably free discharge has taken place from this opening, and there was at first some relief, but the pain has returned, and the redness and swelling of the lids, with the œdematous protrusion of the conjunctiva over the lower, (particularly the latter,) are as great as ever. As the painful symptoms continued, in spite of repeated abstraction of blood locally,—as the discharge had ceased, and the wound healed,—and as a firm, rather prominent, substance could be obscurely felt towards the margin of the orbit, it was thought advisable to cut down on this part, with the intention of removing it, if any distinct tumour should be found. The external commissure of the lids was accordingly divided, and a small piece of indurated substance removed, without any adequate cause of the symptoms being discovered. He continued suffering very severely from pain about the orbit and side of the head, and numbness of the cheek and jaw, with increased redness of the eye and lids, and greater protrusion; these symptoms being only mitigated in degree by local bleedings and narcotics. The protrusion of the globe was now more than an inch; the pupil largely dilated, the iris motionless, and vision lost, except the mere power of discerning a large object, or distinguishing light from darkness.

The protrusion slowly increased, the vessels of the conjunctiva became more turgid, and the general redness of this membrane was greater; the pain in the surrounding parts continuing, so as nearly to prevent rest. In November, the conjunctiva of the globe, which had hitherto remained nearly natural, became of a deep red, while the cornea at the same time inflamed, lost its transparency, ulcerated, and then sloughed. The humours of the eye and some blood escaped when the dead part separated, and the iris protruded, so as to form an irregular dirty-looking mass, with a depression in the centre.

Mr. Lawrence observed, that the destructive inflammatory, ulcerative, and sloughing process of the cornea, with escape of the humours which the eye had undergone in this case, resembled what Magendie had described, as the consequence of dividing the nerve of the fifth pair in animals; and was probably owing to an analogous cause, as the morbid growth which caused the protrusion must certainly have compressed, or otherwise injured, the ophthalmic branch of the nervus trigeminus. The evacuation and subsidence of the globe did not diminish the patient's sufferings, nor the external swelling, which, on the contrary, still increased.

As the complaint had now been progressive for many months, in spite of active treatment, both local and general, and as the health, although in other respects perfect, was suffering under the constant severe pain,

Mr. Lawrence determined, with the concurrence of his colleagues, and of several other gentlemen who had seen the case, to remove the contents of the orbit; the patient feeling persuaded, that the operation afforded him the only remaining chance of relief, and being, therefore not only willing, but desirous of submitting to it. Accordingly it was performed on Thursday, December 6th. The palpebræ were freely separated at their external commissure, and then turned aside, so as to expose fully the anterior aperture of the orbit, the entire contents of which were detached from the cavity, by dissecting close on the surface of the latter, first below, then above and at the sides, until the posterior connexion alone was left. The latter was then divided by a knife, curved on its flat surface, the patient appearing to experience excruciating agony at the moment of dividing the muscles and nerves. The mass, which was firm and almost hard, completely filled the orbit, so that the dissection was necessarily carried close to the bone, and performed slowly. As the ophthalmic artery bled profusely, a conical compress of lint was introduced into the orbit, and held for some time on the vessel; this was removed in the evening, as Mr. Lawrence objects strongly, to the introduction of any foreign body into the cavity after this operation. The divided commissure of the lids was united by two sutures; and the tumid upper eyelid closed the front of the orbit. He took thirty drops of laudanum at night.

7. He slept at intervals, and passed a comfortable night; bloody fluid had oozed between the lids, but there had been no actual bleeding. The palpebræ are swollen and bright red; the face is flushed, and he has slight headach, thirst, and foul tongue. Twelve leeches around the margin of the orbit. Saturnine lotion; a dose of calomel and jalap. The inflammatory and febrile symptoms had disappeared on the next day, and the pain of the brow, head and cheek, which had distressed the patient for so many months, was almost gone. Recovery now proceeded rapidly and uninterruptedly, the surface of the orbit granulating, and producing a vascular substance, which filled up a large part of the cavity; rest and appetite returned, while meat diet speedily restored flesh, strength, and good looks. He was discharged quite well on the 28th December, but has shown himself at the Hospital, in perfect health, within two or three days. The right eye, which had been sympathetically affected before the operation, is now as strong as ever. During the progress of the disease in the left, the right had felt weak, and occasionally painful on exercise, so that he could not use it freely.

The mass removed from the orbit consisted of the collapsed and shrunk eyeball in front, with a hard and incompressible substance behind, extending to the point at which the nerves and vessels had been divided. The recti muscles, unaltered in appearance or texture, covered this substance, the exterior of which

had the usual appearance of the orbital fat, except that it was more dense. An incision was carried from before backwards, directly through the centre of the entire mass. An apparently recent coagulum of blood, separated the sclerotica from the choroid coat, the latter, with the retina, being compressed by the coagulum into a thick cord, extending from the optic nerve to the iris; there was no trace of humours; the sclerotica was natural; the morbid growth adhered to it closely behind, and the optic nerve proceeded through the centre of the mass. The latter was a dense compact structure, of schirrous firmness, resisting the edge of the knife; its exterior consisted of a light gray texture, very much like that of a scirrhus breast, while in the interior this was intermixed with a light yellow, yet firm substance, resembling what is seen in scrofulous diseases.

Mr. Lawrence observed, that he used the expressions "scirrhus firmness," and "scirrhus structure," merely to describe the character of the morbid production, and not to convey an opinion that it was of a carcinomatous nature. He did not entertain the slightest apprehension that disease would return; yet, on reviewing the history of the case, and comparing with its course the bulk and texture of the morbid growth, he was satisfied that the latter would have continued to enlarge, and the sufferings of the patient would have continued to increase, had the disease been left to itself, so that the operation must be considered to have been absolutely necessary.

Mr. Lawrence considered this, in the first instance, as common inflammation and suppuration, and he originally entered it in his case book, as "deep-seated suppuration in the orbit." The symptoms corresponded in all respects, to those of the few instances which he had seen of abscess in the orbit. He would not have expected, *a priori*, that a common cause, namely, long exposure to severe cold, would produce in a healthy young man a diseased growth, similar in external character to the malignant changes of structure.

According to the usual arrangement of diseases, this case would come under the indefinite term of *Exophthalmia*, under which all affections, whether of the globe itself, or of surrounding parts that cause displacement and protrusion of the eye, are jumbled together. No diseases ought to be named from such a circumstance as this, which is merely an effect or symptom. If the name be, however, retained, we should observe the distinctions made by the German ophthalmologists. When the eye is merely protruded, and not altered in any other respect, they call it *exophthalmos*; if the displaced eye be inflamed, they term it *exophthalmia*; when the eye falls out of the orbit, in consequence of its posterior connexions having been divided, or from paralysis of all its muscles, they call the case *ophthalmoptosis*. Mr. Lawrence has never seen the latter occurrence.—*St. Bartholomew's Hospital.*

From the Lancet.

SINGULAR INSTANCE OF GANGRENOUS INFLAMMATION *affecting the Cellular Tissue, behind the Peritoneum, with destruction of the Appendix Cæci.*

The following case, which occurred in the female clinical ward during the past week, has excited much interest. The anomalous character presented by the disease during the life of the patient, with the circumstances revealed on post mortem examination, are highly remarkable.

M. A. H., ætat. 19, was admitted on the 10th of January, under the care of Dr. Cholmondeley. She had been ill several days, and complained of great pain, and tenderness upon pressure over the whole of the right inguinal region; the pulse was quick and thready; the skin hot, and tongue furred; the bowels had been scantily open in the morning; there was occasional bilious vomiting.

The patient had been attended previously to her admission by Mr. Gaitskell of Rotherhithe, and we believe that Mr. Callaway had also seen her. Blood-letting from the arm had been adopted thrice, with the free application of leeches, and a blister to the part in pain. It was surmised from the limited seat of the pain that there was inflammation of the round ligament of the womb, and the circumstance of the girl dating the origin of her complaint from exposure to cold whilst menstruating, gave a colouring to this opinion.

The treatment employed on admission into the hospital consisted in the application of leeches, with the exhibition of one grain of calomel, and a like quantity of opium, every four hours. Enemata were also directed.

On the eleventh, the pulse was quick and sharp, and there was still intense pain in the inguinal region; the patient laid in bed with her knees drawn up, any motion occasioning a severe dragging pain. The bowels had been open several times, but all the evacuations were passed with great pain, and this circumstance had been especially remarked before the patient's admission into the hospital, and also that although there had been frequent watery and thin stools, no solid matter had passed.

On the twelfth, the symptoms continuing unrelieved, blood was taken from the arm to the amount of *ten ounces*, and the pulse having risen, two hours afterwards twenty ounces were abstracted, when, according to a report in the clinical ward-book, the pulse became soft; calomel, with opium and tartar emetic, were prescribed.

On the thirteenth, the pain was still excessive, and confined to the same part; leeches were very freely used.

A report on the fourteenth, states that the patient passed some dark scybala, the tenderness and pain were somewhat less, but there was great fulness and hardness in the course of the cæcum, and ascending portion of the colon. There was occasional vomiting of bi-

lious matter, and frequent hiccup. Ten ounces of blood were taken from the arm.

On the 15th, the sickness was very distressing, being induced on the slightest motion; the countenance was sunken, and all the vital powers were so much lowered, that a small quantity of wine was prescribed. The swelling and pain in the inguinal region were unrelieved.

On the following day, the 15th, the patient had rallied in some degree, and the report in the clinical ward-book states, that there was an obscure sense of fluctuation in the right inguinal and iliac region.

Throughout the 16th, the patient continued in an alarming condition; the bowels were now so freely relaxed, that the motions were passed in bed. About eleven o'clock at night, Mr. Key saw the patient, and "fluctuation being more distinct," an opening was made, of about two inches in extent, through the parietes of the abdomen, and at a short distance above the spine of the ilium. It is stated, that after the opening had been made, a quantity of fætid gas escaped, and also about two teaspoonsful of sanious fluid, which was highly fætid. The opening was effected by cautious dissection, and the peritoneum is said to have been "full an inch and a half from the surface," and "of a blue colour." A cavity was clearly to be traced with the finger.

The patient continued to suffer greatly during the 17th, and died early on the morning of the 18th, having been in the hospital, as will be perceived, eight days.

Post Mortem Examination.—This was made, about six hours after the patient's decease, by Dr. Burne; with his accustomed accuracy. Upon laying open the abdomen by means of a longitudinal incision, no morbid appearance, *prima facie*, was perceptible; but, on drawing back the integuments of the abdomen on the right side, it was found that adhesion had taken place between the omentum and peritoneal covering of the parietes. It was simply, however, an agglutination, and the parts were very readily separated, when it was found that a kind of cyst had been formed by means of the adhesions, which contained a small quantity of dark serous fluid.

The peritoneum covering the back part of the abdomen on the right side, and on which the dark serous fluid had laid, (it being of course, within the bag of the peritoneum,) was observed to be of a dark colour throughout, and there was evidently a collection of dark fluid behind it. The membrane was carefully sponged and wiped, with a view of ascertaining whether there was any lesion of its substance; however, after a minute inspection, none could be detected. An incision was then made through it, and here most extensive disease was found; the cellular tissue, over the psoas and iliacus internus, was engorged with a dark bloody fluid, the substance of the muscles themselves was destroyed to a considerable extent—in fact, the parts were in a gangrenous condition. The back part of the cæcum, and ascending portion of the co-

ion, were of a dark red colour, apparently the result of simply lying in contact with the gangrenous cellular tissue; there was no breach of their texture to be detected, and, although the peritoneum was of a dark colour, it had, as far as could be ascertained, preserved its integrity.

It is highly important to mention, that a considerable portion of the appendix cæci was found to be destroyed, and the remainder had a dark-coloured appearance. The appendix cæci was included in the kind of cyst, which, we have said, resulted from the adhesion of the omentum to the peritoneum of the right parietes. From the circumstance of the destruction of the extremity of the cæcal appendage, it was surmised that some extravasation of its contents might have taken place, but there was no faecal smell either in the fluid accumulated within the bag of the peritoneum, or that which was formed in the cellular tissue posterior to it. And, again, there was no communication to be found, existing between the fluid within and that without, although they did not differ from each other in appearance. The general surface of the peritoneum was free from disease, and no other morbid change than we have described was observed. —*Guy's Hospital.*

From the London Medical Repository.

A Brief Reply to certain Arguments lately advanced against the Doctrine which supposes the Heart to be the sole Organ of Circulation. By F. BAILEY, M.B., &c.

Of all the arguments invented by modern ingenuity against the Harveian doctrine, that the blood is circulated through the agency of the heart alone, unquestionably that is the most plausible which supposes the capillary system endowed with a muscular power. On a former occasion I endeavoured to invalidate the chief grounds on which this supposition then rested; but as other arguments have since been adduced in its favour, these I now propose briefly to examine. I have not, however, the vanity to think it will be my good fortune to place so difficult and so much litigated a point above the reach of cavil or captious objections. This were to expect what is yet a desideratum in some of the best-established truths of philosophy, and even abstract science; but I nevertheless trust I may be able to satisfy candid and considerate minds, that the old opinion respecting the causes of the blood's motion is in no great danger from such objections as those we are about to consider.

The first argument in favour of muscular action in the capillaries, to which I would direct the attention of the reader, is derived from the fact, that after death *the arteries are found empty, and the veins gorged with blood.* Let us then inquire, whether this fact may not otherwise be satisfactorily explained. Upon the supposition that the heart is the sole mover of the blood, it is evident, that, as the

power of this organ diminishes, so will it project its contents with less force, and in smaller quantities. The aorta, therefore, and all its branches, receiving less blood than usual, have their diameters proportionably diminished, by virtue of that well known law of the arterial system, by which it adapts itself to the ever-varying quantity of blood flowing through it. Thus, the direct tendency of a diminished action of the heart is to diminish the quantity of blood in the arterial system. An increased quantity in the veins, therefore, is the necessary consequence. And as this continues longer in operation, so will the disturbance in the balance of circulation continue to increase, until at length, as in the act of dying, the mass of blood is almost wholly transferred from the arteries to the great veins. Thus, easily, and without the aid of capillary action, may the vacuity of the arteries, and the gorged state of the veins after death, be accounted for. Such action, therefore, we may unscrupulously reject; it being bad philosophy to admit more causes than are sufficient to explain the phenomena.

But, say the advocates for capillary contraction (muscular contraction, I mean,) if a ligature be thrown round the aorta, so as to intercept the influence of the heart upon the antecedent column of blood, still these phenomena present themselves: and hence they conclude that the gorged state of the veins must, in this case, be owing to the action of the capillary vessels.

Now, admitting the fact here alleged to be true, the inference drawn from it by no means follows, because it is certain that the ligature cannot destroy the momentum the arterial blood had acquired *previous* to its application, and which, together with the tonic or vital contractility of the arterial vessels themselves, now no longer subject to the distending power of the heart, may (for any thing appearing to the contrary) be sufficient to conduct it through the capillaries to the veins. The experiment being made in a vigorous state of the circulation, the force of blood in the aorta and its great branches may be fairly presumed to equal that which the heart in its dying throbs could communicate. So that in reality this objection amounts to no more than a case of ordinary death, in which, as we trust we have already sufficiently shown, the lost balance of circulation is explicable upon principles quite independent of capillary contraction. But by way of strengthening our argument, *we will trace this muscular doctrine to its consequences.* In the experiment under consideration, the arteries, it is asserted, become empty by virtue of the muscular action of capillary vessels. Well, if so, it is clear that such blood must by some means be brought to these vessels, in order that they may contract on it, and propel it onwards. Now the only causes that can properly be assigned for this effect are, the momentum acquired by the blood previous to the application of the ligature, and the tonicity of the arteries themselves, as already stated. I am aware, indeed, that a third cause would, by some, be alleged. They would assert, that

the capillaries empty the great arteries, like so many little pumps, upon a principle of exhaustion, the result of their alternate contraction and relaxation. Effectually to contravert this position, we need only point out the meaning of the terms contraction and relaxation, as applied to blood-vessels. When any such vessel, by a power inherent in itself, suddenly diminishes its size, it is said to contract. This operation completed, the vessel is supposed to become entirely passive, or is left in such a state as readily to yield to the least distending force,—this is called relaxation; and in that state blood is supposed to be impelled into the vessel by what is usually denominated the *vis a tergo*, or, in other words, by the impulse it receives from the heart. The vessel being thus distended, another contraction succeeds. That such is the ordinary import of the words vascular contraction and relaxation, no one, I think, will deny. To talk of relaxation, therefore, as if it implied a powerful resiliency in the vessel itself, enabling it to augment its diameter, and thereby to create a vacuum, is nothing better than a gross perversion of language: it is, in short, to indulge in a speculation unsupported by fact, and alike repugnant to reason and probability. But admitting, for the sake of argument, the existence of such a vacuum, how, I would ask, can it promote the capillary circulation? Is it not in the nature of a vacuum to attract fluids equally in all directions? And if so, the blood lying beyond it would be as much retarded in its progress, as the blood approaching it from the heart would be accelerated. So that, upon the whole, no motion would be gained; and the expedient would fail in producing the end for which it was intended. In the instance before us, then, exhaustion cannot be the method in which the capillaries act, so as to derive blood into themselves from the great arteries; but thither it is brought, as we have already stated, through the influence of its previously acquired momentum, assisted by the tonicity of the vessels themselves. And if this be a just conclusion, if the blood contained in the great arteries be thus conducted to the boundaries of the capillary system, why may not the influence of these causes be supposed to extend yet further? Is there any fact or experiment which indicates their annihilation at this precise point of the circulation? If not, we may with much greater reason believe, that it is continued through the capillaries to the veins, than that these capillaries act by a muscular power, which the most scrutinising inquiries have never been able to detect, and whose existence is a matter of mere hypothesis, at variance with the testimony of our senses. Whatever, then, the real causes of the capillary circulation may be, it is at least obvious, that consequences bordering on absurdity flow from the adoption of the muscular theory; and, as such, it ought to give place to any other doctrine which is not clogged with similar difficulties.

Death by lightning is said to afford a *third argument* in favour of the muscularity of the

capillary system. In such instances, the arteries, as well as the veins, are found loaded with blood; which circumstance the advocates of this doctrine ascribe to a sudden loss of muscular power in the capillary vessels. But, assuredly, this cannot be regarded as a decisive argument, unless it can at the same time be proved, that the fact is insusceptible of some other equally good explanation. Now it is certain, when an animal is killed by an electric shock, that all the moving powers of the blood are instantaneously destroyed. The right ventricle of the heart ceasing to beat, blood is no longer propelled into the pulmonary system. In like manner, the blood ceases to be thrown by the left ventricle into the aortic or general system. The tonicity of the arteries themselves, also, that important assistant in transferring blood from these vessels to the veins in ordinary cases, no longer operates. So that the momentum of the arterial blood, at the instant of the accident, is the only remaining power capable of producing such an effect. But since the action of the right ventricle is abolished, blood can no longer find its exit from the veins. In these vessels, therefore, it stagnates, and resists the ingress of arterial blood, with a force which the left ventricle, in a state of vigorous action, could not overcome. Impossible, then, is the supposition, that such an obstacle might be removed by the mere force of a previously acquired momentum; and hence, in all instances of death from lightning, and indeed in all other instances as suddenly and completely destructive of life, an accumulation of blood in the arteries, as well as the veins, ought to take place. This we find actually does occur; and since the fact is as clearly explicable upon the supposition of the heart's acting alone as in conjunction with the muscular power of the capillaries, we may fairly conclude that death by lightning affords no proof that the latter operation is conducive to the business of circulation.

Having now, as I would hope, disposed of the objections to the Harveian doctrine of the causes of the blood's motion, at least so far as respects the muscular action of capillary vessels,—I beg to subjoin an additional remark or two in support of that doctrine. It is now almost a century since the accurate and ingenious Dr. Hales experimentally proved that blood issued from a vein with only $\frac{1}{12}$ th of the force it possessed in the corresponding artery; so that not less than $\frac{11}{12}$ ths of its original motion must have been lost in the course of circulation. Now to what can this remarkable change in its velocity be owing? Contemplating the large amount of friction it has to encounter, we could readily persuade ourselves that such a cause might produce a very considerable abatement in the blood's motion; but we do not so easily perceive how this extraordinary defalcation should happen, if, as is contended, the capillary system be really a subsidiary source of power to the heart. Without laying any stress, however, on an argument of the

probable or presumptive kind, I will advert to an experiment of the celebrated Magendie, from which he ascertained that pressure on the crural artery of a dog *instantaneously* affected the flow of blood in the corresponding vein, diminishing its force in exact proportion to the degree of pressure. Now, according to the muscular theory, the capillary vessels are a set of muscular tubes, whose mode of action must therefore be analogous to that of all other muscular tubes, such as the intestines, &c. And did any one, I will take leave to ask, ever observe a contraction, commencing at one extremity of the alimentary canal, *instantaneously* propagated through its whole extent to the other extremity? On the contrary, is it not a matter of notoriety, that the peristaltic motion is a *progressive motion*, requiring a distinct and considerable interval for its completion? And so, also, must it fare with the capillaries upon condition that they are muscular; that is, the blood they receive must, on this supposition, require a sensible portion of time for its transmission—a conclusion directly at variance with Magendie's observation. Which, then, of these conflicting statements shall we receive? An opinion founded on a mere hypothetical basis? or the testimony of a consummate physiologist as to an extremely simple fact, and of so palpable a nature as almost to preclude the possibility of error.

It were no difficult matter to multiply arguments in support of the doctrine we have here been endeavouring to establish; but from these we shall at present abstain, hoping at some future opportunity to show what extensive use may be made of it in the explication of morbid phenomena.

From the Lancet.

STRANGULATED EXOMPHALOS IN THE EIGHTH MONTH OF PREGNANCY.

Elizabeth Wright, at. 31, was admitted into this Hospital on the first of October, 1827. She is a thin woman, has borne seven children, and is now in the 7th or 8th month of her eighth pregnancy. She states that there has been a swelling at the navel from her infancy, and that she has always worn a bandage till her present pregnancy. During her former pregnancies, the part has invariably swelled and become painful between the fourth and fifth month; purgatives have always removed these symptoms until the present occasion, when they entirely failed. On Sunday, Sept. 30, she was attacked with severe pain in the umbilical region, and with vomiting, for which she took pills and castor oil without relief. At the time of her admission there was a large irregular soft swelling at the umbilicus, about two inches in diameter, not very tender and being obviously a rupture, containing principally omentum. The abdomen was neither tense nor painful; the pulse was frequent and hard, the woman was thirsty and feverish, and she vomited occasionally. Castor oil was given, and rejected; injections were

administered, and returned unmixed with feculent matter; 30 leeches were applied to the abdomen, and the taxis tried ineffectually. Mr. Lawrence, who saw the patient at this time, found the swelling very soft, and free from pain, and the abdomen nearly in the same state. Had these points been alone considered, strangulation would not have been suspected; however, the constipation and vomiting showed that the course of the intestinal contents were obstructed, and a portion of intestine might easily be concealed under the soft mass of omentum composing the bulk of the swelling. Mr. Lawrence, therefore, determined to operate immediately, considering the state of pregnancy rather as an additional reason for, than as an objection to, the operation. When the sac had been laid open by a perpendicular incision, carried over the middle of the tumour, a large portion of omentum and a small portion of discoloured intestine were exposed to view. The intestine being returned, and a part of the omentum removed, one or two small arteries were tied, and the wound was brought together with sutures and adhesive straps; her bowels were moved four or five times after the operation, and she slept at intervals during the night. Towards the morning she complained of pain in the umbilical region; there was a little inflammation around the wound, which occasioned tenderness of the parts. The tongue was coated, and the pulse full and frequent; venesection to sixteen ounces; twenty leeches to the abdomen; a drachm of sulphate of magnesia in mint water every three hours.

Oct. 3. She passed a restless night, and is more feverish to-day. Venesection to sixteen ounces; twenty leeches to the abdomen; a drachm of Epsom salt, in the effervescing draught, every three hours; bread poultice to the wound, which appears healthy.

4. She slept better, and is less feverish; the bowels are open, and the tongue clean and moist; pulse 112, and rather sharp. The wound is nearly healed, except at the upper part. Repeat the bleeding to fourteen ounces; continue the draught.

8. She has improved in every respect during the last few days; the tongue is clean, and the pulse slow and soft. This morning a small abscess was opened, which had formed upon the tumour, and discharged a considerable quantity of healthy pus.

19. She continues improving, but complains of weakness. Meat diet.

26. A truss was ordered for her this day, and she left the Hospital soon afterwards.—*St. Barthol. Hosp.*

From the London Medical and Physical Journal.

REPORT OF CASES TREATED AT THE ABERDEEN NEW DISPENSARY, and communicated by ALEXANDER RAINY, Senior Pupil.

I. FISTULA LACHRYMALIS.

This complaint has been treated at the dispensary, for the last six months, in a manner

somewhat peculiar. When matter has formed in the lachrymal sac, and it has been found impossible to introduce a thin probe through the duct, by the nose, the enlarged sac has been laid freely open, and a tent of waxed sponge kept in the wound till its edges have become callous. By this time, the sac having contracted, the external wound shows no disposition to heal, when the tent is removed. The appearance of the artificial opening thus formed is not at all disgusting; and persons, who were liable to frequent suppurations of the part, have remained free from them after this treatment, a little matter only passing through the artificial opening, after being exposed to cold, or any other cause which increases the flow of tears, or the secretion from the meibomian glands. Of course, in these cases the duct has not been permanently obstructed. The following case was the one which first gave occasion to the above treatment:

Mrs. —, aged twenty-eight, had a fistula lachrymalis on the left side, for which the os unguis was perforated, to allow the tears to pass by that way to the nose. This was six years since.

Two years ago, the sac of the right side became inflamed, and suppurated, breaking externally. The opening soon healed, but the same process again took place three months after, the disposition to inflammation becoming so great that it now came on after the slightest exposure to cold, and sometimes an interval of only a fortnight occurring between them. She therefore became anxious for the operation: the physician in consultation, however, advised it to be deferred till after delivery, the patient being in the seventh month of pregnancy; and that, in the mean time, the sac should be laid freely open, and a tent kept in the wound. This was done, and the tent worn for two months; when it was found that the sac had contracted to its natural dimension, and the opening at its edges thickened. The tent, being troublesome, was dropped, and a little clear fluid was occasionally pressed from the cavity, which occasioned no inconvenience; the whole having less appearance of any thing unusual than the other side, where the scar of the last opening was easily observed.

Nothing unusual has occurred since; the external opening being little observable, and so small as only to admit an Anel's probe.

Three cases have been treated in the same way, but the following is the only one which falls within the quarter's report.

Case 2.—Mrs. M—, ætat. forty-five, July 1st, 1827. Has a tumour in the situation of the lachrymal sac, which is extremely painful, having deprived her of rest for the last forty-eight hours. The eyelids of that side are closed from the swelling, and matter can be perceived by the touch. Says she is obliged to proceed to Glasgow to-morrow, and earnestly begs that something may be done to relieve her. Sac to be opened, and tent introduced, with directions to continue it on board of the ship, and for six weeks after.

31st.—Returned two days ago from Glasgow: the sac is now contracted, edges of the wound callous.—Omit the tent.

August 4th.—External opening small, and not to be observed at a short distance. Discharged.

The surgeon consulted in the first case has mentioned, that the same result has happened in a case since treated by him on the same principle.

II. DISEASES OF THE HEART AND AORTA.

CASE 1. *Aneurism of the Aorta, bursting externally through the left Mamma.*

July 15th, 1827. — Binks, ætat. forty-eight, a widow, spare habit of body, tall, chest remarkably narrow. Has been subject for the last two years to palpitation, on the smallest exertion.

Nothing unusual, however, was observed till a twelvemonth since, when she complained of difficulty of breathing and excessive paroxysms of coughing. At that time, the pulsation of the heart could only be felt between the fifth and sixth ribs. The carotid artery, however, pulsated very strongly, so as to be seen by the bystanders. Pulse at these times was unusually quick and small. Digitalis and squill removed the first attack.

In October last, she was again affected in the same way: the palpitations had, however, become more distressing: pulsation could be distinctly felt on the left side of the epigastrium. The throbbing of the carotid was less distinct. Relief was again procured by squill and digitalis; thin mucus being expectorated.

Two attacks succeeded, the symptoms being similar, though of longer duration, and yielding less readily to the remedies employed.

For the last five months, she has been constantly attended from the dispensary. The symptoms have been violent palpitation of the heart, perceived both at the epigastrium and (though less distinctly) below the angle of the left scapula; most distressing sense of sinking on the approach of sleep, and startings after it had come on; cough severe, and still recurring in paroxysms; very scanty expectoration; difficulty of breathing only occasionally occurring, and relieved readily by a draught of camphor mixture, with ether and opium, which frequently procured good nights.

This state of the symptoms continued till June last, when the fourth and fifth ribs, at their anterior extremity, were perceived to be more prominent than usual, and gave extreme pain on being touched, however gently. From that time to the present, the fulness has increased till the whole of the left has become distended with it. The cough and occasional dyspnoea are settled symptoms, and the mucous rattle more or less distinctly heard by the unassisted ear.

Two days ago, the anterior part of the tumour was observed to be discoloured, when several layers of adhesive plaster were laid over it. This morning, however, the blood burst out at a large opening, which terminated

existence in a few seconds. After the appearance of the tumour externally, the pulse had sunk rapidly in strength, and a few small bleedings, which had been employed, were obliged to be discontinued, as an alarming state of faintness occurred immediately on opening the vein. The digestive organs continued healthy to the last, and a small quantity of food was relished on the day of her death. A full meal always produced distressing sense of sinking, and was thrown off on the occurrence of the first paroxysm of coughing.

Dissection, 17th July.—Body much emaciated, completely exsanguineous; left mamma purple, with an opening externally, the size of a penny; bulk of mamma greater than in the prime of life. On enlarging the opening into the aneurismal sac, it was found filled with a firm coagulum; a soft membrane lined its internal surface, easily lacerated at the fore part, but firmer towards the bottom of the cavity. Integuments of mamma unusually firm; between them and the sac a layer of coagulated blood, increasing in thickness as it recedes from the outer opening. Cavity, large enough to hold an orange, communicates, by an opening of an inch in diameter, with the anterior of the chest, the upper and under edges of which were formed by a breach (by absorption) in the edges of the third and fourth ribs. On removing the sternum and anterior ends of the ribs, so as to leave the connexion of the external disease with the parts within the chest undisturbed; the opening was found to lead directly to the ascending aorta. This artery had its diameter increased to four inches, internal measurement, at this part; at its rise from the left ventricle, its coats are thickened to half an inch, and its diameter one-half greater than usual. Opposite to the fourth rib, its size and thickness is most increased, diminishing rapidly to where it takes its bend, where, after giving off the carotid, it becomes healthy; and from the left ventricle to its arch, the aorta has bands of a cartilaginous texture, running through its walls in different directions, and on its outer surface appear depositions of coagulating lymph. The heart is considerably enlarged, but particularly its left side, where its coats are very much thickened. Left auricle and ventricle empty. Walls of the right ventricle thinner and paler than natural, and the musculi pectinati of that auricle uncommonly pale, and very thin. The other contents of the chest are healthy. The left lung small. Carotid artery somewhat enlarged in its diameter, and thickened. No other diseased appearances in the viscera.

Remarks.—The above case is valuable as illustrating the possibility of a true aneurism, and still more as exhibiting the complication of that form with the false. There was a tumour in the region of the carotid, with pulsation, which it will be perceived had disappeared for some time before death,—*there being some dilatation, but no aneurism of that vessel.* From the heart to the arch of the aorta, that vessel was enlarged greatly in its diameter; its

coats much thickened. An opening at its anterior side communicated with an aneurismal sac, lined by several layers of coagulated blood, and which at last burst outwardly. It is surprising that such extensive disease produced so little disturbance in the system.

CASE 2. *Ossification of the Heart.*

Although present at the opening of the body, this case was only seen twice before death, and that not in the character of medical attendant. The appearances on dissection are given first, and afterwards what is known of the previous history.

August 13th, 1827.—John —, aged twenty-two. *Sectio cadaveris.*—Body considerably wasted, with slight œdema of the belly and lower extremities; skin and conjunctiva of a deep yellow colour. An incision was made from the top of the sternum to the umbilicus: the integuments being dissected back, and the sternum raised, some slight adhesions were separated which connected the pericardium to the sternum, and which had the appearance of being recent, and were easily torn. From four to five ounces of bloody serum was found in each side of the chest. The pericardium and heart occupied a great part of the left side of the cavity, the left lung being completely hidden in this view. The pericardium extended upwards as far as the top of the sternum and below its adhesion to the diaphragm, was five inches from side to side, and four from back to front. From the anterior edge of the upper lobe of the left lung, a strong band stretched across to the contiguous side of the pericardium, of about three inches in breadth, and one in length. A similar band joined the inferior lobe of the right lung to the pericardium. The anterior edges of the two lobes of the left lung were also connected by a strong adhesion, which formed a bridge over the sulcus, separating them. Between the back part of the left lung and the ribs opposite their angles, several stringy adhesions were formed, some of them three inches in length. The lungs otherwise were remarkably sound. On opening the pericardium, an ounce and a half of fluid, similar to that in the chest, was removed. The heart exposed was of natural colour, except some yellow spots which penetrated a small way into its substance, near the apex. A little way to the left of the septum, an irregular cavity appeared, about three lines in length, with puckered edges, and having the appearance of the cicatrix of a recent ulcer. The cardiac veins on the surface of the heart were very large, and distended with blood, particularly those on its under surface. On removing the heart, and cutting into the right auricle, the sinus venosus and proper auricle were of a proportionate size to the rest of the organ: its coats, however, were so thin, as to be translucent in the intervals of the musculi pectinati, which were pale, and farther asunder than usual. The tricuspid valve was strengthened by membranous bands, extending from the insertions of the chordæ tendinæ to the parietes of the ventricle. The sides of the right ventricle

were thin. The *calumnæ carneæ* somewhat pale, and formed a close and complicated network, at the bottom of the cavity. On looking at the left auricle, the walls of the sinus venosus were found to be of a dense membranous-looking substance, a line and a half in thickness, and without a vestige of *musculi pectinati*, or muscular texture; these, however, were present in the proper auricle of this side. The left ventricle presented nothing unusual, till, on removing its valve, an osseous body was found, the size of a horse-bean, imbedded in its parietes, at the root of the valve. At its outer edge, eight ounces of clear serum was found in the abdominal cavity. The liver of natural colour and size, but somewhat firmer than usual. Spleen small, circular, and firm.

The following are the particulars known of the case, the termination of which is related above:

The individual, from his fourteenth year, had been of a very infirm constitution, and was unable to pursue steadily any employment, having in vain tried several. For the last three years he had been subject to palpitations at the chest, on using much exertion, which, from being feeble and confined to the region of the heart, increased from time to time till the whole of the chest heaved with the motion, and the pulsation was distinguishable at the epigastrium, and left hypochondrium. Three weeks since, anasarca appeared, which rapidly spread over the lower extremities, belly, and back. From the time of its appearance, the palpitations ceased; but the stomach became irritable, rejecting all kinds of food, in any, even the minutest quantity. The appearance of the countenance was anxious in the extreme, and, after the swelling approached the body, the recumbent posture became impossible. Sleep was difficult to be procured, and its approach looked for with terror, startings interrupting it at its commencement. The medical attendants were necessitated, a few days before death, to make small punctures in the scrotum, prepuce, and feet, which drew off a great quantity of water. He sank soon after. During the progress of the complaint, the pulse exhibited great irregularity: latterly, it gave the feel of a fluid passing through a confined tube, and intermitted frequently, defying all attempts to reckon it. He dated the rise of the complaint to a severe pleuritis, which accounts for the old adhesions. Valsalva's treatment kept the disease long in moderation, but latterly he used no depleting measures, and no remedy except *digitalis*.

Query, was the ossification the original cause of the disease? If so, we presume it must have existed from the commencement. Even at the age of twenty-two, when he died, we imagine the occurrence of such a morbid formation in this organ to be extremely rare.

Case of Suppuration of the Kidney; with Dissection.

August 17th.—Magnus Lister, ætat. fifty, formerly a sailor, latterly a weaver, complains

of severe pains in the loins and hypogastrium, with frequent desire to make water, which is red and scanty. Bowels costive; nausea and vomiting. Has a scrotal hernia, which he can return at pleasure. Passed some small stones, of a white colour, by the urethra, a week since. Has occasionally complained of pains in the right ride for three years past, on exposure to severe fatigue; has suffered considerably from fever; and disturbance of the digestive organs, with severe pains in the region of the kidneys and bladder, which generally ends in the passing of small calculi and sabulous particles.—*Habeat infusi lini ad libitum.*—*Injiciatur enema statim.*—Warm fomentations to the loins.—*R. Ol. ricini ʒj.; tinct. opii gtts. l. statim.*

20th.—Became rapidly worse after last report. The secretions of urine and fæces having failed, notwithstanding the exhibition of diluents and the free use of cathartic medicines. For the last two days was much distressed with hiccup, and latterly nausea and vomiting of dark coloured matters. Died this morning.

Dissection, 22d, seven A. M.—An incision was made from the upper edge of the inguinal ring to the bottom of the scrotum, when the hernia was found to consist solely of omentum, which was more vascular than that in the abdomen, though there was no constriction at the ring. The abdomen being laid open in the usual way, the stomach was found drawn down by the omentum a considerable way; the large curvature opposite the umbilicus. The bowels were of a healthy colour. Some old adhesions were seen between their different convolutions, which separated with the greatest ease. Bladder was found with its coats thickened to nearly half an inch. Its interior was divided into two cavities, each of them capable of containing a walnut, and not admitting of farther distention. The ureter leading to the right kidney was enlarged, so as to admit the fore-finger with ease; its inner membrane was white, pulpy, and thickened. The right kidney was seven inches and a half in length, and proportionately broad; its walls were but half an inch in thickness, and on the lower part of the anterior surface a pit was observed, having all the appearances of a cicatrix; its outer surface had a vascular appearance, but, on being cut into, was paler than usual; its pelvis was found empty. The left kidney was only three inches and a half in length, of the usual figure and colour, excepting at one part where its investing membrane was raised in the form of a vesicle; its walls were of an unequal thickness, at one part being as thin as parchment; on cutting into its cavity, it was filled with pus and pieces of cheesy-looking matter. Body was otherwise sound.

From the London Medical Gazette.

AXILLARY ANEURISM OF THE RIGHT SIDE.—Operation of tying the Subclavian Artery.

William Weston, æt. thirty-eight, a stout and very muscular man, was admitted Novem-

ber 28, under the care of Mr. Bransby Cooper. About three months ago, he felt a slight pain and numbness just below the middle of the right clavicle, which extended down the arm to the fingers; this occurred once or twice a week, increasing in severity each time. At the end of a month, the paroxysms had become so violent, that, during their continuance, he was obliged to desist from his ordinary occupation—that of a wood hawker. In nine weeks from the first attack, his attention was directed to a slight fulness upon the upper and fore part of the chest. Sixteen years ago he worked very hard, excavating a dock; he drank freely at that time, but has lived very temperately for the last few years.

Upon examination, a large pulsating tumour was perceived in the axilla of the right side, extending to the fore part of the chest, and producing a fulness about the size of an egg, between the subclavius muscle and clavicular portion of the pectoralis major: the tumour could be traced so far back as the edge of the latissimus dorsi; the base could not be distinctly felt; handling the swelling increased the pain; a very slight pressure on the subclavian artery completely stopped the pulsation in the tumour. The arteries of the arm were uninfluenced by the aneurism, the pulsations at both wrists corresponding, which, however, were unusually feeble. The numbness and pain had become so great, as entirely to deprive him of rest. He was ordered a little aperient medicine, a day or two prior to the performance of the operation, which took place on Tuesday, Dec. 4.

The patient was placed upon a long table, in the horizontal posture,* with the shoulders slightly elevated, the head directed to the left side, the right arm forcibly drawn down, and the shoulder depressed. The integuments covering the clavicle were stretched upon the chest, and the operation commenced by making an incision, about three inches long, which laid bare the edges of the sterno-cleido-mastoideus and trapezius muscles; when the skin, from its natural elasticity, retracted, so as to leave a free opening above the clavicle, exposing the superficial cervical fascia, the platysma myoides being perfectly divided. The centre of this incision was met by a vertical cut, in the direction of the posterior edge of the sterno-cleido-mastoideus. The external jugular vein was distinctly seen on the inner side. The anterior edge of the scalenus anticus muscle was next laid bare by clearing away (with the sharpened handle of the knife) the condensed cellular texture, during which process the omo-hyoideus was exposed, and the artery immediately seen emerging from between the scaleni: it was easily cleared from the surrounding parts, so as to admit of the passage of the aneurismal needle. This instrument deviated from the one generally used, by

forming a larger portion of the segment of a smaller circle, so as to occupy much less room. A single silk ligature was passed under the artery, and tied in the ordinary way; the vessel could then be seen pulsating between the heart and the ligature, although previously the pulsations could scarcely either be seen or felt. One end of the ligature being cut off close to the artery, the other was left at the external wound. The integuments were brought together by a single suture, and adhesive plaster, and the right arm and hand were enveloped in flannel. The patient was then replaced in bed, having scarcely lost an ounce of blood; indeed, only one small artery was divided, and which ceased bleeding without being tied. The pulsation in the tumour entirely ceased upon the application of the ligature, and the sac soon became completely empty. The patient expressed great relief. He went on in the most favourable manner till the 7th, when he had a tingling sensation in the arm, accompanied with great pain; at this time, too, he had slight difficulty of breathing, and considerable restlessness: these symptoms, however, subsided, together with the pain in the arm, upon the exhibition of the submuriate of mercury, $1\frac{1}{2}$ grs., opii. 1 gr. Gentle aperients have occasionally been administered, the effect of which has produced more than usual lassitude, rendering it necessary to administer small doses of ammonia, which have always removed the disposition to depression. The wound was dressed upon the fourth day, when it appeared very healthy, and was quite free from pain. Since the operation his pulse has generally been from 80 to 86, varying but very little either in frequency or fulness. The temperature of the limb is not in the least diminished.

December 11. Upon visiting him this morning, we find that he has passed a good night, and is, in every respect, going on well.—*Guy's Hospital.*

From the London Medical Repository.

ON THE INSIDIOUS NATURE OF CHRONIC DISEASES, WITH CASES, AND POST MORTEM EXAMINATION. By J. G. W. Esq. Surgeon, Member of the Phrenological Society of London.

CASE I.—*Scirrhus Carcinoma of the Rectum, forming a Stricture attended with symptoms of Intussusception.*—Mrs. P. ætat. 58, of a robust figure and habit of body, has always enjoyed good health, and is the mother of two children, the youngest being sixteen years of age. She states that she never was subject to pain in the bowels or to hernia. About a week ago she ate a little damson pudding, and thinks she swallowed two or three of the stones; for a day or two she experienced a little griping in the umbilical region, but her bowels were perfectly regular and her appetite good up to Wednesday evening, when she was about to leave home, with her husband, in his canal boat, on a voyage from Newport Pagnell, in Northamptonshire, to the

* Mr. Cooper here remarked upon the necessity of the horizontal posture, for the entire deprivation of all muscular action, every fixed point being thus taken away.

collieries, in Staffordshire. She paid little attention to these transient pains until she arrived at Birmingham, when they had acquired such violence, attended with vomiting, that it became necessary to consult a medical man, as she had had no evacuation from the bowels. Boluses of extract of colocynth and calomel, with a mixture of senna and salts, were prescribed. This failed to operate, and occasioned an increase of the vomiting, with much pain in the bowels. Fomentations were applied throughout the day, (Saturday) with very little relief.

On the Sunday following, October 14th, I first visited her, and found the symptoms aggravated; vomiting incessant; no stools; some difficulty was experienced in voiding the urine; tongue furred and dry; great thirst; pulse 88; skin hot; she has had no rigour from the first. She attributes her sufferings to over-distended bladder.

I, therefore, introduced the catheter, and drew off about two ounces of high-coloured urine, but the pain was not relieved by the operation—R. Ol. croton, gutt. vj. calomel, gr. xxx.; panis, q. s. ut ft.; pil. xij. cap. ij. 2da. quâque horâ donec purg.; and I directed three clysters, each containing 3j. of assafoetida, to be injected with one hour interval.

October 15th. The pills and the clysters have been given. Not at all relieved. Passed a very bad night; constant and distressing vomiting; no stools, abdomen more tumid; has made water freely; pulse the same. One teaspoonful of brandy to be swallowed when sick. I gave, by a syringe with elastic tube, three aloetic clysters, each containing 3ij. of aloes; also one of gruel afterwards. Continue pil. extr. coloc. c. et calomel, with a powder containing five grains of calomel, every three hours. The warm bath to be used this evening.

October 16th. Symptoms the same, excepting that there is a little more excitement and flushing in the face, pulse 92. At a consultation it was determined to make trial of venesection, as an antispasmodic, and to give one and a half grains of opium afterwards, and to rub in mercury to produce salivation. The VS. occasioned great faintness. Milk, beef tea, gruel, and yolk of eggs, have been severally tried with small quantities of brandy, but every thing is immediately rejected.

17th. The pills were supposed to be rejected, but they remained long enough to be partially absorbed, for they produced sleep, which was almost uninterrupted during the night, as well as ease from sickness, which has now again returned. The pain, which was originally seated on the left side of the navel, is now on the right, with great tenderness. Abdomen is excessively distended; she complains of great tightness and severe gripings; flatulence; heart-burn, bilious vomiting, yellow in colour; pulse 74; tongue furred, but moist.—Emplast. lyttæ ampl. abdomini. Pil. gambogiæ comp. cap. iij. 2da quâque horâ; if vomited, capt. ol. ricini, 3vj. or brandy and water. I injected with the same apparatus a large quantity of tepid

water, but it returned without effect. Mercurial infusions to be continued.

18th. The case now appears almost hopeless; passed a very bad night; incessant vomiting; bowels still unmoved; tympanitic; spasms constant; tongue dry; pulse 68; urine continues free; constant heart-burn; vomits a dark green matter; great restlessness. I injected a pint of pure oil, and used considerable force to overcome the obstruction. This clyster remained for some time. To chew a little calcined magnesia for heart-burn.—Rept. the pil. opii (gr. j.) at bed-time.

19th. Passed an easy night, no vomiting these last eight hours. Pulse 60; tongue dry and brown; pain trivial; makes water freely.—Cont. pil. opii at bed-time; cont. infusion of mercurial ointment; cont. brandy and eggs.

20th. Not so good a night; continues to vomit at intervals dark matter, tinged with bile. Pulse 60, regular; tongue dry and brown; abdomen extremely distended. On the supposition that some part of the descending colon might be intussuscepted, I attempted to inflate the lower bowels. I introduced the elastic tube (such a one as is used for the stomach pump) at least a foot in length; she felt it pass up to the navel and move about; having adapted a pair of small bellows, I compressed them with great force several times; on withdrawing the tube a great quantity of air escaped, and with it a little faecal matter.—Pil. opii to be repeated at bed-time.

21st. Vomiting not controlled; now it is become stercoraceous; extremities cold; eyes everted.—Tinct. opii gutt. xxx. at bed-time.

22d. Pulse 50; black stercoraceous vomiting; hiccup; delirium at intervals; picking the bed-clothes; extremities cold; profuse sweats; mind wavering; impeded respiration. Death took place early on Tuesday morning.

Inspectio Cadaveris.—Body not much emaciated; muscles rigid and well developed, resembling those of a male subject.

The abdominal muscles were greatly attenuated, hard, and contracted, like all the other muscles; indeed the whole system resembled much that of a person I once examined, who died of tetanus. On laying open the abdomen no air escaped, but the intestines presented themselves enormously distended. There were in the small intestines three bands of longitudinal fibres, as in the large, distinctly visible; and many of the convolutions were adherent in this track, upon their surface. The small intestines were six inches round; and the colon, at its arch, in many places ten inches and one nail; in several places the peritoneal reflexion had given way, and the muscular coat protruded in the first portion of the duodenum; the intestine was on the point of bursting. There was no general inflammation, but the vessels were loaded, and dusky in some parts, especially near the cæcum, near which there were four or five damson stones, quite loose, in the intestines, and not in any way obstructing the ilio-colic valve. In tracing the intestines downwards, no obstruction was discoverable until I arrived at the lower

part of the rectum, when a narrowing was most palpable just below the sigmoid flexure, and immediately in juxtaposition hung the left ovary in a state of scirrhus, considerably enlarged, as well as the fallopian tube on the same side; the right appendages were quite healthy, but the uterus was much harder than natural. The rectum being removed was opened, and above the stricture was found distended with faces, in a harder state than in the other portions of the bowel, and empty below. On slitting up the intestine, its coats were discovered thicker and harder than natural; and, about six or eight inches from the anus, its calibre was so narrow that it would not admit the point of the fore-finger without some force. At this point it was in a state of scirrhus; and, internally, cancerous ulceration appeared to have gone on, as a sort of fungus started from its surface, coated with mucus, interspersed with vessels of a villous appearance. Immense appendices epiploicæ were attached to the rectum, and its coats were imbedded in fat: the mucous membrane above the stricture appeared inflamed, and the whole track of the large intestines, above the obstruction, was loaded with more or less liquid faecal matter, and gas. The above appearances of the rectum are clearly shown by the preparation in my possession; the liver was slightly tuberculated; the stomach was contracted, and the spleen quite shrivelled up. All the thoracic and abdominal organs were healthy.

This case presents two very interesting points for consideration. The one is, how the chronic disease could have remained in a latent state so long, without the slightest manifestation: the other, how the passage of the faces was obstructed when the stricture was large enough to admit the point of the fore-finger, even after such various clysters had been tried, and how adhesion should take place between the folds of the intestine without the symptoms of inflammatory fever? On these facts your readers will decide.

CASE II.—*Inflammation of the Brain, with Effusion of Blood and Serum into the Lateral Ventricles, arising from a carious state of the Basiliary Process of the Occipital and other Bones.*—J. P. ætat. 19, of a spare but muscular frame, by trade a collier, who, for a series of years, has been subject to scrofula in the cervical glands; also to ulceration of the lachrymal sac, and of the lower palpebra of the left eye. He worked up to Saturday, the 22d of September, when he first complained of febrile symptoms; viz. lassitude, shivering, and hot fits; pain in the head and extremities. Notwithstanding such symptoms, he made two efforts to work this week, but becoming worse, I was sent for on Saturday, September 29th, 1827.

I found him lying on a temporary bed, with his head towards the fire (which is customary in this part of the country,) complaining much of giddiness, vertigo, pain in the head, back, and right side, which on pressure was very tender; the expression of his countenance was

like one in an advanced stage of typhus fever; he was scarcely capable of walking across the house; his tongue was dry and brown; his pulse 100, irregular, and intermitting; his respiration rather laborious; delirium during sleep; vomiting had been frequent during the week, and bilious diarrhœa accompanied it; he was very fretful, and his behaviour sullen; his bowels were now costive, and his sickness less urgent.—*R.* Calomel, gr. iij. pulv. rhei gr. xv. ft. pil. iij. s. s.; pulv. effervescent. iv. suig. Low diet.

September 30th. He was no better; pulse 90, intermitting; his tongue moderately moist; bowels have not been moved; expressed a great wish to have purgative medicine given him.—*R.* Calomel, gr. xx. extr. coloc. c. ℥ij.; m. ft. pil. xij. capiat ij. 2da. quâque horâ donec purg.

Oct. 1st. Much worse; stupor has increased, but he answers questions tolerably when roused; pulse 60; tongue more dry; complains of severe pain in the head; bowels moved twice; black stools.—*VS.* ad ℥viij. empl. lyttæ nuchæ. *R.* Calomel, ℥ij. divide in chart. iv.; cap. j. ex theriac. vel gelatina, 4ta quâque horâ.

2d. Much faintness after the bleeding, but afterwards the pulse rose, and is now 80; great stupor; feet and arms cold; no stools.—*VS.* ad oj. emplast. lyttæ ij. cruribus. pulv. calomel, iv. (℥j. suig.) cap. j. 6ta quâque horâ ex gelat.

3d. Apparently much worse; feet and arms quite cold; countenance more pallid; eyes sunk and everted; pulse 60; tongue moist; gums swollen; complains of soreness of the teeth; fætor of the breath; he is evidently under the influence of mercury; bowels moved once; black stool; answers questions more rationally, and is not so deaf. The skin has been throughout dry and scurfy. The urine has been very high coloured and scanty, but voided with consciousness. The sensibility much blunted; the skin can be pinched without pain. Finding the depletory plan with counter irritation fail, in addition also to the action of mercury, I determined to change the treatment to one of a stimulant nature. I ordered a little brandy and water to be given; hot bricks to be applied to his feet and hands.—*R.* Sps. æther nitr. ℥vj. mist. camph. ℥v. m. capt. cochl. ij. larg. 3tia quâque horâ; calomel 3ss. to be taken at bed-time.

4th. Much the same; delirium during sleep; frequent fainting fits; collapse appears to be taking place; cold extremities; pulse 60; tongue dark in the centre, but moist at the edges.—*R.* Ammoniac carb. 3iss. syrup et magnus. carb. q. s. ut ft. pil. xvij. cap. iij. 3tia quâque horâ. *R.* Ammonia carb. 3ss. mist. camph. ℥vj. m. capt. cochl. ij. larg. 3tia quâque horâ.

5th. Insensibility increased; could not be kept in bed; phrenitic furor; constant jactitation and screaming; active delirium; was sick once after the medicine; several of the doses were followed by delirium tremens, or a sort of trembling which almost amounted to con-

vulsions. Pulse 48; no stool; tongue covered with black sordes; blood oozed from the gums.—Pil. calomel et jalap. xvij. cap. iij. 2da. quáque horá.

6th. Quite senseless; constant moaning and raving; bowels have been moved, and the stools were not involuntary; has passed his urine naturally throughout the attack; feet and arms cold. There appeared so little chance of any good being effected that no further medicine was ordered. He died the next day with convulsion.

Inspectio Cadaveris.—I was only allowed to inspect the brain.

On opening the cranium, the vessels of the dura mater attached it closely to the bone; the veins of the pia mater were gorged, and the sinuses remarkably full; there was no change in the membranes, except increased vascularity. On slicing the brain it was very full of bloody points; the lateral ventricles contained about four ounces of limpid serum; at the bottom of each there was a stratum of coagulated blood of considerable thickness, which, traversing the whole inferior surface, descended through the foramina of Monro, into the third ventricle, which was full of coagulum. The fourth ventricle was distended with coagulum alone, and the spinal cord was so much altered in structure about the corpora olivaria and tuber annulare, that it could not be traced; it became more healthy at the lowest point at which it could be reached with the scalpel from the cranial cavity, where it assumed the white colour; but above this point to the tuber annulare, it was of the colour and consistence of a carrot poultice. There was a carious state of the internal table of the basilar process, into which the scalpel penetrated with freedom. A probe passed easily through the ulcerated opening, mesially to the orbital plate of the sphenoid bone, and externally to that of the ethmoid, into the posterior nares, where caries also existed, but time would not allow any further examination either of this or other parts.

In reviewing the progress of these symptoms it appears the brain was the original seat of the disease, and that the disordered state of the stomach and bowels was merely symptomatic. The reciprocal sympathy of the brain and liver was the cause of its over excitement in the first instance, and in proportion as the functions of the former declined, those of the latter became abolished, since the scruple doses of calomel failed in exciting it to action. When, however, the constitutional effect of mercury became apparent, it certainly did produce a beneficial change, and it is the more surprising it should, considering the malignant nature of the disease. For a short period, the mind recovered its powers; the hearing of the patient was more perfect, and many other symptoms were moderated in their severity. It is quite uncertain at what period the cerebral inflammation commenced, most probably it was recent, and the result of contiguous disease. If a physician of the old school had visited this patient at first, I have no doubt he would

have pronounced it to be a case of typhus in an advanced stage, in which there existed a tendency to putrescency of the fluids, which, in other words is, perhaps, better expressed by a tendency to death; for as to supposing a taint of this kind to pervade the frame it is most unphilosophical and absurd, and yet I have heard a physician, of the year 1827, say seriously, that he believed there did exist a putrescent state of the fluids in such cases, and he had the greatest reliance on æther and camphor julep or opium with bark and a liberal allowance of wine; but with what success I know not. The above history of symptoms and morbid appearances shows the folly of trusting to such remedies.

From the Philosophical Magazine.

ON THE ORIGIN OF THE POWER OF SUSPENDING RESPIRATION, POSSESSED BY AQUATIC MAMMALIA AND BIRDS. By LAWRENCE EDMONSTON, Esq.

To determine the nature and conditions of that power which certain species of aquatic animals possess of suspending respiration for a considerable time, has long been an interesting object of physiological investigation; but the most accurate observations and ingenious experiments seem hitherto to have failed in removing the obscurity in which this singular phenomenon is involved. Can this have arisen from the erroneous direction in which research has been conducted; or can it result from the insurmountable difficulty of the subject! Has the obvious suggestion been sufficiently attended to, that this anomaly of respiration may constitute one of those ultimate facts in the laws of vitality, which, in its nature, may be independent of peculiarity of organization?

We observe certain diving animals that breathe through lungs, as whales, seals, and water-birds, remain long under water at one time, and not merely in a state of quiescence, but often expending great muscular exertion. We know that a much shorter period than this, without respiring, must be necessarily and immediately fatal to land animals similarly formed; and we are then too hastily disposed to infer, that this singular faculty which aquatic animals possess, must depend on some undetected peculiarity of structure. The problem was supposed to have advanced towards solution, when it was asserted that, in aquatic animals, the foramen ovale remained open, and that in them there was something analogous to fetal circulation.

But, in the first place, it is unproved that in them the foramen ovale is oftener open than in land animals; and, in the numerous individuals of the two species of seal (*Phoca barbata* and *P. vitulina*), which I have dissected, I have never found it open, but in fetuses. But, secondly, though this were the fact, it affords no solution of the question,—of the faculty which these animals possess of supporting life, not merely like the fetus, with the external senses dormant, and supplied with oxygenated

blood through the medium of the mother, but in all the play and vigour of their faculties, without the action of the lungs or the access of oxygen. The foramen ovale remaining open may cause less blood to circulate through the lungs, and more to be thrown on other organs; but the fact by no means accounts for the animals being able to sustain vigorous and perfect life, while venous blood must be circulating through the brain, and the vital function of respiration totally interrupted. If it be conceded that provisions may be found, in the increased size of the liver, spleen, or veins of the abdominal viscera, for receiving an additional quantity of blood, diverted from the lungs during the suspension of respiration, still this points out only a change in the distribution of the circulating fluid.

It can hardly be assumed that, the moment the animal dives, those processes, which exhaust the blood of its oxygen, are interrupted; for still, at the moment of suspending respiration, much venous blood must necessarily be existing in the circulation. And can we suppose that, until respiration is renewed, the venous blood remains in the pulmonic system without being carried to the systemic heart? Such an hypothesis, not more visionary than some others, only, like them, multiplies difficulties: it supposes, for instance, a power of suspending the processes which exhaust the blood of those vivifying principles which it receives from respiration. It supposes the pulmonic and systemic hearts to be, not merely in function different, but in action separate from and independent of each other. It presumes that the left ventricle contracts on vacuity, or that the aorta and its tributaries can, at the will of the animal, become substitutes for the action of the heart.

Can we assume that some other organ is vicarious of the function of the lungs, analogous to what we observe to a certain extent to obtain in some secretory functions, as those of the skin and kidneys; or that the system enjoys the power of accumulating an additional stock of oxygen to supply its diving exigencies? Or can we imagine that the liver, or any other organ, deprives in a great measure the venous blood of those qualities which render it so deleterious to life in terrestrial animals, when carried through the arteries to the brain, as the experiments of Bichat especially, and of other eminent physiologists, luminously demonstrate? To all these suppositions the same general objection applies,—that they are not only entirely destitute of proof, and inadequate to the solution of the difficulty, but multiply others equally unaccountable. While, therefore, the most minute and laborious anatomy has failed to unravel any peculiarity of structure adequate to account for this phenomenon, the doubt naturally arises, whether, in every case of difference or modification of function, we are entitled to presume difference of structure; whether the faculty in question may not be one of those modifications of the vital principle independent of tangible peculiarity of organization? And,

under this impression, the hypothesis which appears to me to be the simplest, and to be supported by analogy, is, that the conditions of the nervous systems of aquatic animals are such that venous blood requires a much longer period to circulate through their brain than in that of land animals, to produce the same deleterious effects. Why should it be matter of surprise that the brain of aquatic animals should have peculiar relations to certain fluids circulating through it; or that their nervous system should be less or more susceptible of sedative or stimulating influence? Different animals, and even different organs in the same animals, are very differently affected by similar causes; and in such cases we do not always necessarily presume difference of structure. Is it even wonderful that the excitability of aquatic animals should be such as to render them unable permanently to bear the same highly oxygenised blood as land animals; much in the same way as we suffer, and should at length die, by breathing air in which there is more than its usual proportion of oxygen? Different species of terrestrial animals require, *cæteris paribus*, unequal quantities of oxygen; and even different individuals of the same species, both in health and disease, are dissimilar in this respect.

Why may not the natural and healthy state of the blood in aquatic animals have a tendency to the venous, as that of terrestrial animals has to the arterial standard? And this, indeed, I believe to be the fact; for, in all amphibious mammalia and birds which I have examined, the blood has much more of the venous than arterial appearance. If this fact be established by a sufficiently ample induction, it would seem decisive of the question; and it would furnish a satisfactory reason why aquatic animals decline and at length die, when placed in situations where they are long deprived of the power and the necessity of diving.

I have also observed, that if seals, after remaining on the rocks for an hour or two, are killed before returning to the water, the blood is more florid than under opposite circumstances; and that, after long reposing on land, and then betaking themselves to their native element, they in no instance, when they first dive, remain so long under water as in most other occasions. These facts may be obviously accounted for by supposing that respiration in these situations being longer continued without interruption than usual, the blood had become more highly oxygenised; and that hence the brain, being temporarily more highly excited, could not at once bear so long a continuance of the venous influence. I have repeatedly ascertained that the dark venous blood of the seal, when exposed to oxygen, as speedily assumes the arterial hue as that of any other animal.

To a certain extent, also, this capacity of suspending respiration is under the influence of habit, as we see exemplified by those individuals, even of our own species, engaged in the pearl fisheries. And moreover, this faculty, even in aquatic animals, is limited, and

differs in the different species; for beyond a certain period they, like land animals, are unable to remain under water. I have seen seals taken in a net, and, when not allowed to come to the surface to breathe, life became extinct generally in less than a quarter of an hour. In this case, it is true, the violent struggling to get loose would naturally abridge the period during which they could remain under water in a tranquil state, which I should believe to be somewhere about twenty minutes.

The young of the great seal, like the young of the other species of *Phoca*, is brought forth on land, and must remain there a month or six weeks before it can live in the water. If before this period it be thrown into the sea, it exhibits as much anxiety and awkwardness as a young dog, and cannot remain longer, without inconvenience, under water. The young of the common seal, on the contrary, follows the mother to the water immediately it is born, and swims and dives with ease and perfection; a difference so strongly marked, and so decidedly established, as, in my opinion, sufficient to constitute, among others, a most important feature of specific distinction between them.

With respect to whales, I have been often assured by intelligent Greenland shipmasters, that they have been frequently known to remain upwards of an hour under water; and this also accords with my own observation. The difference, therefore, in this faculty, which we remark in different kinds of aquatic animals, and between these and land animals, seems more to consist in degree than in kind.

If a land bird, as a crow or a pigeon, be thrown into the water, even while the head is kept up, it is as speedily *drowned* as a cormorant under it. For this fact we can give no other adequate solution, than by referring it to some peculiarity of the nervous system. It may, indeed, be argued that the cause of death in this instance results proximately from the spasmodic closure of the glottis, produced by the shock of immersion. But why should this occur in the land bird more than in the cormorant?

Not only is the quality but also the quantity of blood in aquatic animals different from that in land animals. In the former, the quantity is much greater in proportion to their size. In whales and seals, for instance, it is excessive; and their capacity of great and continued muscular exertion is also strikingly conspicuous. Can this depend chiefly on the different quality or increased quantity of the vital fluid; or on some particular condition of the nervous energy?

On a review of what I have here advanced on this subject, it appears to me that we may be justified in assuming that the nervous system of aquatic animals breathing through lungs is so constituted, that the venous blood requires a much longer period to circulate in the brain before it produces death, than in land animals. That the natural and healthy state of their blood is *sub-arterial*; and that it is not necessary, in accounting for the superior pow-

er which they possess of suspending respiration, to presume any peculiarity of organization.

These views I have long entertained; and they are founded on an ample experience of many years, both as a zoologist and a sportsman, in situations peculiarly favourable for accurate observation on the economy and structure of aquatic animals.

From the Edinburgh Medical and Surgical Journal.

ESSAY ON THE TREATMENT OF CARIES, WITH REMARKS ON THE DISEASES OF BONE IN GENERAL. By JOHN INGLIS NICOL, M. D. Member of the Royal College of Surgeons, London, Member of the Faculty of Medicine of Tubingen, and one of the Surgeons to the Northern Infirmary at Inverness, &c. &c.

In the early or acute stages of the simple forms of diseases of the bones, enlargement of the vessels, and the other marks of inflammation, are conspicuous characters. The periosteum commonly thickens, and is not unfrequently accused as the origin of the mischief. Suppuration follows; the matter works its way among the soft parts towards the surface, and is discharged by one or more openings, which sooner or later become fistulous. This discharge continues perhaps for years, longer or shorter, according to the situation and extent of the disease. The constitution, if not previously impaired, ultimately gives way. Much of the bone dies; and unless the powers of nature, or the strength of the constitution, aided by the usual remedies resorted to in such cases, be sufficient to throw it off; or if manual assistance be not successfully interposed, hectic comes on, and gradual exhaustion follows.

In the more complex diseases of the bones, or those of the osteo-sarcomatous character the structure becomes altered by inflammation sometimes, though not always, of specific origin. Enlargement takes place, and the osseous substance degenerates into a mass, somewhat analogous to cancer,* being usually preceded by similar lancinating pains, which become more acute or severe, as the disease advances. This is sometimes rapid, sometimes slow. In its progress the periosteum, ligament, muscle, tendon, vessel, nerve, in short every thing it approaches, become involved in the diseased action. All become a homogeneous mass, which is sometimes hard, sometimes soft, or often both textures are to be found existing together. The skin ulcerates, and the uncovered tumefaction exhibits an irregular, cancerous surface. As hectic advances, the strength gradually diminishes, and the patient dies. In some cases, however, the morbid enlargement is confined entirely

* In this country, as well as in other places, most tubercular formations of malignant character are usually designated by the appellation of cancerous.

to the bone itself, the osseous growth simply by pressure causing the absorption of the soft parts, which impede its progress, and the bones themselves are equally compelled to give way under similar circumstances. This is well exemplified in their absorption from the pressure of large aneurismal tumours. All the bones are liable to these malignant affections; but they are found to occur most frequently in the bones of the face. Tumours of the antrum are very common; and whether the complaint originates in the bone or investing membranes, the former invariably participates in the morbid action as the disease advances.

Scrofula, siccums, syphilis, as well as several other diseases of the whole system, produce considerable changes in the bones. In a case of tubercular sarcoma which fell under my observation, the bones of the skull were studded, both on the inside and outside, with grayish pulpy patches, having osseous radii shooting up through them, the tables being entirely absorbed, and the diploe only left in the parts thus affected. Diabetes mellitus in its latter stages produces a remarkable change in the alveolar processes. They become carious, the gums spongy, and the teeth fall out.* Several such cases have come under my notice.

The general affections which more particularly refer to the bones themselves may be comprised under the terms *Mollities*, *Rachitis*, *Fragilitas*, and *Exostosis*. But as these diseases are, comparatively speaking, of rare occurrence, and little under our control, I shall for the present confine my observations to those in which our art can be interposed with advantage.

Nodes or *Tophi*, *Caries*, and *Necrosis*, are the affections which most frequently come under the management of the surgeon. These may result either from injury done to the parts, or from a morbid condition of the system; and where there is no evidence of the one, it is legitimate to conclude that they originate in the other.

In the earlier stage of their syphilitic affections, they are usually overcome by general treatment alone; not so when ulceration has taken place. The constitution already impaired, becomes more so under the continuance of local irritation; and not unfrequently resists every remedy or application which the healing art can devise. But perhaps still greater inveteracy exists in those of scrofulous character; and the practitioner, disappointed in his attempts to remove the former, is often disposed to attribute his want of success to the taint of the latter. Most of the cases of caries or necrosis which I have seen, whether

preceded or not, were always accompanied by morbid irritation of the constitution, even where the health might be considered good, and these affections had become habitual. There was an evident languid peculiarity of expression, which conveyed to the mind an impression of the existence of this irritation, and which certainly does not always depend on scrofulous diathesis, as it is often found to disappear almost immediately on the removal of the part offending.

Those affections, which may be considered as purely scrofulous, sometimes appear to originate in the bone; but several other textures remotely situate are attacked successively with similar enlargement and ulceration. And it is highly probable that a like disposition is generated in the system, by the long continued irritation of an ulcerous or necrosed bone, resulting from simple injury.

Cases of this kind are very common among the poorer classes of society. They seldom seek assistance under fluctuating expectations of amendment. They put off from day to day, until their complaints have resisted the powers of the constitution. In these circumstances the discharge is sometimes less, sometimes greater, varying with every change in the part, which either accidental circumstances or the progress of the disease may produce. The variety of parts affected, their situation and extent, may all preclude much expectation from local management in this state. General remedies alone are relied on, but hitherto with very limited advantage. Nature, however, interposes her influence in some cases deemed utterly hopeless; and when the resources of art have been in vain exhausted, her efforts alone apparently effect a recovery. These cases occur but seldom, and the difficulty with which such ulcerations are found to heal, or the dead parts to be thrown off, are enough to limit our expectations from the powers of nature alone. For although in a few cases the healing process may go on steadily enough, yet no surgeon of experience can justify himself in an entire reliance on a spontaneous cure.

The treatment of such cases has hitherto been but little influenced by the investigation of the causes from which their several varieties have been supposed to originate, or by knowledge of the structures which they had assumed. For ages past the character of the remedies have been pretty much the same; and it is to be regretted that the changes which these diseases undergo have been more successfully examined than the means of averting them pointed out. Observations of alleged causes and minute details of structures, with the exception of those of syphilitic origin, seem thus of little importance in regulating their management in the diseased state. If the affection be presumed to be constitutional, the constitution is attacked; if considered local, local remedies are used; and every effort is made by manual interference to remove it entirely, if at all practicable. The great bulk of failures, however, appear to have arisen from extreme reliance on the one, while the

* This is not a uniform result. When it takes place, the process seems to be one of absorption, in which the vessels of the lining membrane gradually destroy the connexion between the alveolus and the tooth, while the alveolus itself is successively wasted or consumed.—ED.

other was indifferently attended to, or neglected altogether. Both seem indispensably necessary, and I feel the more confirmed in this opinion from the want of success in the earlier part of my own practice; while, by the subsequent happy combination which I am about to describe, and which I have now been using for upwards of fourteen years, cures have been effected under the most unpromising circumstances.

Reflecting on the rapidity with which syphilitic affections of the bones give way under the use of mercury and sarsaparilla, I was induced to try their effects on osseous diseases of different origin. But it was not until I had combined active local treatment with the constitutional management, that I had the satisfaction of realizing my expectations. The topical remedy which I have hitherto found most successful, is a rod or pencil of lunar caustic, conveyed in every case to the surface of the diseased bone.

The cases which I am about to relate, are offered to the profession without the least pretensions to novelty, in so far as regards the remedies employed. The success of their application alone has a claim on its attention. And unless I may be considered to have fallen into a common error, of attributing to them that which has been exclusively the work of nature, I am not without hope that the same mode of management may be found equally successful in the hands of others,—a hope which I rejoice to say has, in some measure, been confirmed by the communications of several professional friends who have tried it, on my recommendation, with similar success.

Case I.—A gentleman, a native of Scotland, while leaping a ditch in the West Indies, sprained his right foot. The usual remedies were applied, and he got apparently well. Shortly after he perceived a slight tumefaction over the upper and inner surface of the metatarsal bone of the great toe. He went about as usual, occasionally submitting to the leeching, embrocations, and blistering prescribed by his surgeon, neither of which were productive of the slightest benefit. The tumour increased, and he walked lamely. Becoming alarmed and anxious, he requested further assistance, and a consultation was held; the result of which was a recommendation to return to his native country and have his limb amputated. He embraced the earliest opportunity of carrying the first part of this advice into effect. On his arrival he placed himself under my care. I found a tumour, of rather diffuse character and irregular shape, about the size of a large fig, over the middle part of the metatarsal bone of the great toe. Part of it was firm and part elastic, conveying the impression of both solid and liquid contents. It was always increased by walking, was not painful on pressure, and the integument was of the natural colour. He walked with difficulty, always putting the side of the foot to the ground. It had continued pretty much in the same state for several months. His general health was good.

I applied a bandage, and in a few days the tumour was so much reduced as to enable me to imbed my finger in a deep sulcus in the bone, thus leaving no doubt of its being the seat of the disease. The bandage was discontinued, and the tumour soon acquired its former size. A trocar was introduced into the softer part, and about a table-spoonful of a thin brick-coloured matter, with small whitish flocculi, similar to what we see discharged in evacuating suppurated scrofulous glands of some standing, came away. To give free vent to this the opening was enlarged with the knife, and a fungated lobular growth was discovered sprouting from the corroded bone. It seemed weakly organized, some of its limbs having a semitransparent ash-coloured gelatinous appearance. The contiguous bone was so soft as readily to admit the probe to pass through it. Excision of the parts was proposed but resisted. In this state of things I passed a rod of lunar caustic of the usual size into the opening, in the direction of the fungus, touching the diseased bone at the same time, and confined this application to one particular point. This was repeated daily in the same spot, twirling the caustic between thumb and finger two or three times at each introduction. In a few weeks the tumour gradually disappeared on the inside. A part of it however could be distinctly felt, extending to the contiguous metatarsal bone. A small incision was made above, towards its outside, and the caustic was introduced here also to the depth of half an inch. Violent inflammation of the whole foot succeeded, but was subdued in the course of a few days under the use of antimonials, aided by fomentations with infusion of poppy capsules. The caustic was again introduced as at first, and no inflammation followed. On several occasions, however, I attempted a more free use of the escharotic, with the view of rapidly destroying the morbid growth; but the inflammation which succeeded each of these trials was so violent that I was obliged to desist, and confine its use to the manner already detailed. The fungus was observed gradually to diminish, but the general health became affected. One pound of compound decoction of sarsaparilla was now given daily. The foot was fomented over the part affected morning and evening, and the caustic applications continued as formerly. In a few weeks not a vestige of the fungus could be discerned. The last made opening was permitted to close. The discharge from the other became more healthy, and the parts firm. The small opening at which the caustic was first introduced filled up, and latterly it could not be inserted without some violence. The vigorous process of nature at length resisted it entirely; the parts healed up, leaving a deep furrow from the absorption of the bone; the perfect use of the limb was restored; and during the whole curative process not a particle of bone was observed to escape among the discharges.

Case II.—A young gentleman, about 16 years of age, having over-exerted himself in

running, was seized with inflammation along the right shin, extending towards the knee. The surgeon who attended leeches and applied evaporating sedative lotions, by which the inflammatory process was in a great measure subdued. Ulceration however followed some time after along the flat upper part of the tibia; and the integuments gave way in two places, about the distance of an inch and a half from each other. The discharge became limited and unhealthy; the upper end of the tibia enlarged; the knee excessively pained; and the general health bad. Leeches and evaporating lotions were again applied over the knee without any benefit, and diaphoretics were also freely administered without any relief. The case becoming alarmingly retrograde, and the parents anxious, I was called in. The knee was much swollen, and the leech-bites had become vesicated, presenting the appearance of pemphigus. The whole upper end of the tibia, and for some inches downwards, was evidently enlarged; its anterior tubercle projected unusually, and was soft, but not tender to the touch. The orifices of the ulcerations previously described, had enlarged to nearly an inch in diameter, communicating freely with each other, and exposing the periosteum, which was glairy, and discharged a thin sero-gelatinous rather than sero-purulent matter. Hectic had existed for some time, and the strength was much exhausted. The tibia was now pronounced in a state of extensive disease internally, and the treatment completely reversed. An incision with a scalpel was made on the outside of the enlarged tuberosity, and a rod of caustic introduced close to the bone. One single point of the periosteum at each of the ulcerations below was touched in a similar manner. Fomentations of poppy capsule were applied two or three times daily; four ounces of *Decoct. Sarsaparillæ comp.* were given morning, noon, and night; and from half a grain to a grain of opium exhibited two hours after each dose of the decoction.

In twenty-four hours, tranquillity was restored to the limb. In three days the hectic fell off. This plan of treatment was continued, substituting for the opium as many tea-spoonfuls of the following mixture, as the stomach could bear without sickness or nausea.—*R* Antim. tartarizat. gr. iv.; solv. in aq. cinnam. \mathfrak{z} vij.; tinc. opii \mathfrak{z} i. M. The swelling in the knee disappeared; that in the bone diminished; and two thin circular films, evidently separations from the outer lamina of the tibia, were discharged at the openings. The ulcers turned healthy; but as they healed, absorption of the bone underneath became evident, especially at and about the points to which the caustic was applied. The opening at the tuberosity was permitted to heal up, but the caustic was steadily continued at those below. A deep longitudinal rugged sulcus remained in the bone, and the caustic, which now could not be introduced without violence, was abandoned. A very small oozing of matter was observed occasionally at the

deeper pits in the furrow, where the escharotic had been applied; but its subsequent use prevented further mischief. In about four months from the time I first saw him, he was perfectly whole; and is now a graduate in the profession.

Case III.—An officer in the British army, while serving in the peninsular war, received a gun-shot wound in the leg. The ball passed through the right tibia, high up, and lodged in the inner splintered fibular side of that bone. A probe could be passed through the wound directly to the ball. I proposed its extraction, but the army surgeons, and Sir Astley Cooper, to whom the case had been submitted, having expressed a different opinion, my proposal was not entertained. He walked lamely, and occasionally suffered great pain, which was relieved by immersion in tepid water, low diet, and purgatives. For several years he went on in this way; the ball shifted its position, and the discharge, which always continued more or less, sometimes nearly dried up, but was immediately succeeded by severe inflammation and increase. On one of these occasions the matter was discharged lower down, and the upper orifice healed up. At this time the relief from the topical applications was indifferent, and very tardily procured. Constitutional irritation came on; his general health declined; and numerous external and internal remedies were used without much advantage. Being strongly advised to try the effects of a mineral (sulphuretted) water in this neighbourhood, I again saw him on his way thither. His general health had suffered greatly, and although there was nothing very remarkable in the appearance of the affected limb, beyond what has already been detailed, he described the torture which he occasionally experienced, as being peculiarly distressing. I recommended the use of the caustic, and fomentations, with the decoction of sarsaparilla. It was some time after he had commenced drinking the mineral water, and discovered its inefficacy, that he was prevailed upon to adopt them.

The caustic was introduced at the fistulous opening to the depth of a quarter of an inch only, and daily repeated. Fomenting before each application, and compound decoction of sarsaparilla to the extent of six ounces was taken morning, noon, and night.

The relief was immediate; the fomentations and sarsaparilla were soon given up, but the caustic has been continued with comfort ever since. He now walks with little lameness, but the orifice still discharges some matter, and probably may continue to do so while the ball remains in his leg. His general health is good, and he considers himself comfortable from his knowing the means of relief, should he require them.

Case IV.—A young man, a carpenter, falling through the scaffolding of a house, received a contusion on the right leg, a few inches above the outer malleolus, not so severe, however, as to prevent his resuming his work.

About a month thereafter the parts inflamed

and swelled. Suppuration followed, but six months elapsed before any outward discharge took place. A sluggish ill-conditioned ulcer was found, which soon assumed a progressive character, the upper extremity cicatrizing, and the lower extending farther down towards the ankle. Various applications were tried, but the ulcer was not healed.

The formation of an abscess over the instep became evident, and the matter discharged itself through several openings, which soon became fistulous. In this state he was admitted into the Northern Infirmary. The foot was œdematous; the fistula discharged ill-conditioned and highly offensive matter; the ankle-joint seemed free from disease, and the general health was still good. The outer malleolus and tarsal bones were discovered by means of the probe to be in a carious state. The foot was ordered to be fomented three times in the day; a pencil of caustic to be introduced at each of the fistulous openings daily; and he was placed upon full diet. Under this treatment, some of the sinous openings healed up, but others broke out, and he continued pretty much in the same way for several months, when his health being good, and the foot looking tolerably well, being kept improving under the steady use of the caustic, he was recommended to go home for change of air, and to manage exactly as he had been treated in the Infirmary.

Inattentive to the injunctions given him, his foot got worse, and he returned in about four months thereafter to the Infirmary. His general health was now bad; his foot had an ugly matted appearance, and was increased to double the natural size; numerous fistulous openings occupied the upper part, leading to the carious tarsal and metatarsal bones. There was little motion in the ankle-joint, every attempt at which was accompanied with excessive pain. The caustic and fomentations were resumed; turnip and effervescing poultices were applied; opium and full diet were given; but in despite of every thing, the enormous diseased mass seemed to get the better of his constitution. A consultation was now held, and amputation pronounced necessary to save his life. Upon repairing to the ward to make the communication, symptoms of amendment were evident; the openings had become clean, and the ulcerations looked more healthy; the system was less irritable, and the operation was for a time superseded.

No alteration was made in the treatment; the caustic being regularly and steadily continued, together with the fomentations, and the occasional use of poultices, the latter being only applied to such parts as exhibited marks of inflammation. The fistulous openings closed up, one after another, his health continued steadily to improve, and in about three months he was able to walk a little. He left the hospital with one or two of the openings still discharging; but by continuing the same treatment he very soon got perfectly well, and able to resume his work. A few small pieces of bone were observed to come away during the

whole progress of his complaint; but the absorption of the bones affected was very considerable. I had the satisfaction of seeing this man a few days ago after walking a distance of ten miles. I examined his foot very particularly. It was much smaller than the other, and the seat of the disease presented an extraordinary appearance of elevations and hollows from absorbed bone, which had never been regenerated.

Case V.—A military gentleman while shutting with his left hand a door, his back turned towards it at the time, felt something snap at the left elbow joint. In half an hour after, the most excruciating pain supervened immediately above the inner condyle of the humerus. There was no swelling nor discolouration of the skin. A bandage was applied, which was kept constantly wetted with a solution of acetated ammonia and laudanum. The pain subsided, and nothing further was observed. In a few weeks he joined his regiment, but shortly after was attacked with the most severe rheumatic pains in the head, legs, and arms, and especially in the seat of his former pain at the left elbow-joint. For these symptoms he was subjected to courses of sarsaparilla with mercury; drank chalybeate water; and had many other things given him with intermitting benefit. The elbow-joint became stiff, and was repeatedly blistered, without any abatement of pain. In this way he was afflicted for nearly two years. Having obtained leave of absence, he returned home. The frontal bone over the left eyebrow was now much thickened, and tender to the touch. The lower end of the left humerus was enlarged about the size of the fist. The ends of the fore-arm bones appeared healthy, but very little motion of the joint was admissible, from the obliteration of the humeral fossæ, by the altered structure of the bone; which, by his own account, was unquestionably making progress, and had attained a considerable size before it was discovered by the regimental surgeon. The health was bad, and the rheumatic pains very distressing.

He was ordered four ounces of compound decoction of sarsaparilla, morning, noon, and night; and as many tea-spoonfuls as the stomach could bear of an antimonial mixture, similar to that prescribed in case second, two hours after each dose of the decoction. A small incision was made with a scalpel, in the most prominent part of each condyle of the diseased humerus down to the bone; and a pencil of lunar caustic being introduced into the opening, was turned round two or three times between thumb and finger, pressing at the same time against the bone. This application was repeated daily, and the joint fomented prior to each dressing. The diet was light and nourishing. The pain in the joint gradually diminished; the enlargement of the frontal bone disappeared, and his health improved rapidly. This plan of treatment was continued for some time, when he was again ordered to join his regiment. Passing through Edinburgh he consulted an eminent profes-

sor, and an equally distinguished staff-surgeon, then at the head of the army medical department in Scotland, both of whom strongly urged him to desist from moving the joint, and to discontinue the caustic, that anchylosis might take place. I as strongly urged my own mode of treatment, which was continued; and I have the satisfaction of knowing, that, although the morbid conformation of the humerus was not removed, its progress was completely arrested; the limited motions in the joint were preserved, and his health perfectly restored.

Case VI.—A boy about eight years of age, was attacked with scarlatina, and soon after his recovery, he was seized with one of those violent inflammations and suppuration of the internal ear which so often follow this disease. The purulent discharge continued for several weeks, and his hearing became impaired. The surgeon who attended used astringent injections, but latterly directed the parents merely to keep the parts clean with tepid water. The discharge becoming more copious, exceedingly offensive, and the deafness increasing, I was consulted. On examination I discovered a fungus obliterating the whole passage at its innermost extremity; and the character of the discharge was such, as left no doubt as to the state of the bone. Three ounces of compound decoction of sarsaparilla was given, morning, noon, and night; a teaspoonful of the antimonial mixture with opium, half an hour after each dose of the decoction; and one grain of Plummer's pill every night at bed-time. A small pencil of lunar caustic was inserted into the fungus, and regularly repeated every day at the same point; a fomentation being applied over the ear previous to each application of the caustic. The parents were instructed to manage these applications, and he returned home.

In a few weeks the fungus disappeared entirely, and a piece of bone, about three-fourths of an inch long, and one-fourth in diameter, was discharged at the meatus; his hearing was perfectly restored, and the discharge dried up.

Case VII.—A lady rising suddenly from a trunk in which she had been packing clothes, twisted her right knee so severely, as to render her incapable of moving.

Leeches, evaporating lotions and fomentations, were applied successively, with considerable benefit; but she could not move the limb without exquisite pain in the whole knee-joint, and was thus compelled to keep the extremity constantly in the horizontal position. Pain, with a burning sensation shooting up from the lower end of the tibia towards the knee, followed, and seemed to be more concentrated at the upper end of the bone, about three-fourths of an inch, laterally and inwardly from the anterior tuberosity, which felt tender to the touch. The joint was neither swollen nor outwardly inflamed. Blisters and fomentations were applied without benefit.

Conceiving the case to be one in which the articular cartilages were more implicated than the bones, I strongly urged the use of caus-

tic. Five months of great suffering however, elapsed, before she could be prevailed on to try it. It was only, when even opium ceased to afford the accustomed temporary relief, that she yielded to my recommendation. At this time there was no change of parts worthy of remark beyond what has been stated.

An incision with a scalpel was made into the severely pained, though slightly elevated part of the tibia, and a large pencil of caustic introduced to the bone. Fomentations were also used, and the caustic daily inserted, and turned two or three times round in the opening. Soon after the purulent discharge commenced she experienced manifest relief; but when the caustic was by any chance intermitted, the pain immediately returned, and as immediately disappeared on its reapplication. Tiring however of its use, she allowed the issue to heal, but was soon compelled to have it again re-established. By its continuance, she got so well as to be able to put her foot to the ground, and with the assistance of a crutch to walk a little. The joint was stiff, (not anchylosed,) but free from pain.

The issue was again allowed to heal up; and she went on daily improving for about two months, when unfortunately, in reaching for something, she lost her balance, fell backward, and twisted the affected knee. This was followed with severe pain, inflammation, and swelling of the whole joint, which was subdued by repeated leeching, fomentations, and by the insertion of the caustic issue on each side of the *ligamentum patellæ*. She gradually got so much better, as to be able to resume the use of the crutch, putting the toes only to the ground. The limb being contracted by long continuance in one position, precluded any greater use of it. Her general health was tolerably good, throughout the whole progress of her complaint, and she was now so far recovered, as to be able to walk tolerably well with the assistance of a stick.

To the preceding cases, numerous others, some of them equally unpromising, might be added, in which precisely the same mode of treatment was resorted to with similar success. It was only where the system was completely undermined, by long-continued purulent discharges from extensive disease, in the more advanced stages of those of specific character, in old hip and knee-joint cases, and in carious affections of the bodies of the vertebrae, that either the local or constitutional remedies proved of little use. But in most other cases, from the judicious application of the *argentum nitratum*, with the occasional use of the sarsaparilla, both of which constitute the principal features of the treatment now recommended, the benefits experienced were as decided as could have been desired.

It is indeed true, that where the diseased or dead portion of a bone can be readily and easily removed, the cure is expedited by seasonable operation. But this cannot at all times be effected, both from the situation and extent of the parts on the one hand, and the timidity of the patient on the other. Besides,

there are many excellent surgeons in the profession, who frequently meet with cases favourable for such measures; but not possessing the necessary dexterity in surgical manipulations, prefer milder measures, or letting them alone, to attempts at requisite but difficult operations. Even were it otherwise, there are some patients who would infinitely, sooner carry on after their own way, and prefer continuing the victims of disease, rather than submit to cutting, sawing, or chiselling, although assured that ten minutes, or as many seconds only, thus occupied, would afford substantial and permanent relief.

It is under these circumstances, that I consider milder treatment, if at all successful, of some value. That which I now with deference attempt to advocate, having in the course of my own experience proved most satisfactory. I feel myself warranted in asserting, that although these means may be oftentimes slow in effecting the desired change, yet in those cases in which the constitution is at all susceptible of improvement, by the local interruption of the diseased action, they will ultimately be sure.

Within the limits of an essay such as the present, it is impossible to be so minute in detail as could be desired; but the simplicity of remedies admitting of such general application, will in some measure apologize for those omissions, which more complex management would render indispensable. Considering the manner of conducting the treatment at present of most importance, I shall now proceed to make a few general observations on the individual remedies usually resorted to, and endeavour to point out such peculiarities in their application, as may be deemed of greatest value in a practical point of view.

General blood-letting can only be resorted to with advantage in the acute stages of those diseases of the bones, which partake of the gouty or rheumatic character; and even here only where the system is robust or plethoric. Under almost every other circumstance, I consider it entirely inadmissible; since any temporary benefit will be found to prove no compensation, for the aggravation of the morbid irritability which often precedes, or almost invariably follows these affections.

Measures less fraught with injury to the general strength seem to promise more substantial advantage. In the earlier part of my practice I was in the habit of giving the compound powders of ipecacuan, solutions of tartarized antimony with laudanum, or opium with calomel. Latterly I have used with still greater advantage the *Vinum Colchici*, with Battley's *liquor opii sedativus*. These I have used in the proportions of two or three parts of the former to one of the latter; giving to an adult thirty drops or more every three or four hours, according to the urgency of the symptoms, and continuing until the stomach or bowels became affected, or copious perspiration was excited.

Of the *colchicum* I cannot speak in too high terms; and must say that the inflammatory ac-

tion will be extremely rapid, or have done much mischief previous to its use, if this medicine does not arrest its progress. As it often leaves an indescribable languor of the whole system for thirty or forty hours after it has taken effect, it must be intermitted until the state of collapse has entirely disappeared. To leeching it will be found an adjunct of the greatest value. Whether the affection be superficial or deep-seated, if there be much pain, or reason to apprehend acute action, leeches should certainly be applied over or as near the part as possible. Scarifying and cupping, from the greater irritation, may be more beneficial in less active cases. But I have remarked, that in almost every instance when the most decided relief did not follow local abstractions of blood, proportioned to the magnitude of the mischief, especially by leeching, either simple ulceration, necrosis, or disease of a specific character, soon became manifest.

After the acute stages of inflammation have passed away, by ordinary tact, the periosteum will often be felt thickened, or the bone itself enlarged. In this state it is customary to resort to embrocations, liniments, and blisters. Although the two former are of considerable use in reducing enlargements of the soft parts, under similar circumstances, they are unquestionably not productive of so much good here. Blistering, and keeping a part open with *ceratum sabinae*, I have found to answer much better, and still more so the use of the ointment of tartarized antimony. The purulent eruption produced by this application I have often seen to exert a powerful influence over the diseased part; and it combines the further advantage of being more easily borne.

In Germany, affections of the bones and joints, especially knee-cases, are believed to be the consequences of repelled cutaneous eruptions; and the particular affection of the former, it is alleged, may be identified with the peculiar character of the latter.* In Britain, an idea nearly similar has been promulgated regarding syphilitic diseases, where it is asserted that several varieties of secondary eruptions can be identified with a corresponding variety in the primary sore.† Neither of these opinions, however, have obtained sufficient weight among the profession to influence the general practice; although, if once confirmed, in every view they would be of the highest importance; as we could produce almost every variety of cutaneous affection, although divested of their specific characters by artificial means. Thus the erythematous inflammation may be caused by stinging with nettles, the papular by ammoniacal embrocations; the vesicular by cantharides; the pustular by tartarized

* This opinion has been entertained and acted upon for a long period by Professor Autenreith, senior; and the success attending his practice affords the strongest proof of its being well founded.

† Vide Carmichael on Syphilis. Quarto edition.

antimony; and the most intense itching by the *Dolichos pruriens*, and so on.

In many cases after the disease has been arrested by the means to which I have adverted, the bone continues enlarged, or the periosteum thickened, and the application of a soap or mercurial plaster, with slight compression by means of a bandage, where it can be applied, seems all that is necessary. But often absorption does not take place, and the enlargement may continue, although perfectly harmless, during the remainder of life.

Where, however, the mischief is still disposed to show itself, from slight causes or exertions, the establishment of a caustic issue will be indispensably necessary. When the most prominent part can be easily reached, I have invariably made an incision with the point of a scalpel, down to the bone, and not larger than was sufficient to admit a pointed rod of lunar caustic, of the usual size, which was immediately introduced, twirled round two or three times, and instantly withdrawn. A poultice of wheaten bread and milk, or mashed turnips, was then applied, and renewed twice a-day until the eschar separated, or the purulent discharge was established. The caustic was introduced in a similar manner, daily or every second day, according as the slough was thrown off. When, however, the diseased structure could not be reached without injury to important soft parts, I contented myself with an incision to the depth of one-fourth or one-half inch, and using the caustic as already mentioned.

In hip cases and vertebral affections I have used the caustic potass exactly in the same way, and certainly with much greater satisfaction than the usual slow process of destroying the integuments through an aperture cut in sticking-plaster. In either case it is not necessary, after the manner here recommended, to wet the escharotic, the blood being abundantly sufficient to dissolve as much as will be enough to answer every purpose; while its viscid and coagulating property will prevent unnecessary destruction of parts. The potass, however, will not admit of such free use as the other, and should be almost immediately withdrawn after its introduction.

Short of the actual excision of the parts, I consider the lunar caustic to be the sheet-anchor in the treatment of affections of the bones. In the hands of all practitioners it has proved of the highest value, but, like every other remedy of established reputation, is sometimes liable to abuse. If too liberally applied, or too often repeated, severe inflammation will inevitably follow; an irritation intended to be contiguous or remote will become continuous. But if confined to one point, or where fistulous outlets have been established, or if it is introduced to a very limited depth into one or more of them, no mischief need be apprehended; on the contrary, the inflammatory tendency will be subverted. I have observed this in a remarkable manner confirmed in a case of caries of the orbital ridges of the superior maxillary bones, when the eyes were

exceedingly prone to inflammation. A few hours after the introduction of the lunar caustic, (reduced to the size of a crow quill,) this would entirely disappear, but was always sure to return, if by any chance it happened to be intermitted, and was invariably aggravated if too freely used. The same thing I have often observed in caries of the bones of the hand and foot, and was consequently obliged to have the caustic cast into rods of much smaller dimensions than usual,—accommodated both to the size of the opening, and the extent of the affection. Where the carious or necrosed bone could be readily reached, I usually passed the caustic to it; but where the soft parts intervening were greater than half an inch in thickness, I never penetrated deeper; and the greater the depth, the less free use in turning was observed, at all events until the parts became accustomed to its application.

When inflammation supervenes in cases of caries or necrosis, either from the too free use of the caustic or other causes, the application of fomentations, with decoction of poppy capsules, will be found among the most tranquilizing. At all times, indeed, whether inflammation exists, or threatens, or not, I have found fomentations of great advantage. In those cases where the action of the parts have become languid from long-continued discharges, and the constitution is weakened, the local energies will be considerably improved by fomentations; and they are further attended with another advantage of no mean importance, viz. that of keeping the parts always clean. Under these impressions, I have continued to use fomentations for a few minutes or longer, before each application of the caustic; and I may observe, that I have not found the same advantage from immersions into, or pouring the tepid infusion or decoction over the parts, as from wringing flannel cloths dipt into, and applying them as hot as the patient could comfortably bear.

The occasional use of turnip poultices will be found of some service, but unless frequently renewed, they emit a disagreeable fetor, both from the change which soon takes place in themselves, as well as admixture with the offensive discharges. It will, therefore, be advisable to dust them over with powdered charcoal, previous to their application, which should always be preceded by fomentation.

When the parts have acquired a healthy character, one fistula will heal up after another; and their vigorous action will resist the further introduction of the caustic; but so long as it can be used without actual violence, it will certainly be prudent to protract or continue to resist final cicatrization.

It is perfectly true that no effect will be produced by the application of caustic to inert or dead osseous matter. But the irritation of the contiguous vessels will excite absorption of the offending parts, or cause the living to throw off the dead; and while this irritation is confined to particular points, the influence over the disease will be exerted in the direction of the exterior irritant, proceeding from

the remotest part of the interior.* But in whatever way the caustic acts, whether by contiguous, continuous, or remote, local or partial sympathies, as a continued derivative, after the manner of the acupuncture, or merely by keeping the outlets sufficiently open to give free vent to the discharges, we have abundant evidence of its utility in promoting the healing of caries, in accelerating absorption, in facilitating the separation of the dead from the living parts, and in arresting morbid osseous enlargements, to enable us to decide in its favour. Whether it exerts a specific power over the parts is equally matter of doubt. The disappearance of fungous growths, by continued applications to one particular part, would incline me to this opinion, which receives some confirmation from the character and termination of the first and sixth cases which I have described.

Of the moxa I have not had much experience; but where I did try it, the results were not so satisfactory as those which have been reported by others.

The actual cautery I have used with advantage; and I can truly assert, that when it is applied with dexterity, and nearly at a white heat, the pain is by no means so great as might at first sight be imagined. Unless, however, the iron be brought to a sufficient heat, and adroitly applied, it will unquestionably aggravate the mischief, rather than prove beneficial.

When the excision of the part will not prove detrimental; when little prospect is entertained of effecting a cure by less formidable means; where the patient is passive in regard to the operation, and the part can be with facility removed, there can be no question with regard to the superiority of this measure over every other.

In all these affections, especially those of long standing, the effect of topical remedies will be powerfully aided by the use of those which invigorate the general health, and improve the state of the constitution. For this purpose I have found nothing to equal the sarsaparilla, exhibited in the form of its compound decoction. The formula employed was that of the Dublin college; and from the benefits witnessed under its use, I have no hesitation in asserting that the disappointments which others have experienced, and which have led to so many conflicting opinions regarding its medicinal virtues, may be justly referred to the badness of the article furnished by our druggists,—an assertion which may be

* I have used the caustic after the same manner in the treatment of abscesses. In a case of empyema and a psoas abscess, where upwards of an English pint of matter was discharged daily for several days after the first partial evacuation, the caustic was regularly introduced to the depth of half an inch into the openings at each dressing, and both patients got well. The constitution was supported at the same time.

verified by repeated trials of the several varieties usually offered for sale. That imported from Jamaica is decidedly entitled to a preference. In a conversation which I recently had with Dr. Saunder and Mr. Nautier, an eminent physician and surgeon in Rotterdam, a variety of this medicine was introduced to my notice, different from any which I had ever seen; and from their report must be much more powerful than that commonly used in this country. I could procure none of it either in London, Liverpool, or Glasgow; but having as yet made no trial of the quantity now in my possession, I cannot speak as to its superiority.

In some cases where the decoction did not appear to do much good, tartarized antimony in solution, with tincture of opium, were given to such an extent as the stomach could bear without nausea or sickness, two hours after each potation, as was also the calomel pill every night, or second night at bed-time, with the best effects; nor was the same improvement observed by the use of the latter alone. In every case, therefore, where the decoction *per se* is found to be inert, it may be advisable to combine the others ere it be abandoned.

It is scarcely necessary to observe that the diet should be both light and nourishing, and that all salt and highly-seasoned food should be studiously avoided.

As the object of the present essay is purely to communicate the results of the practice which I have pursued in the management of diseases, regarding which the sentiments of the profession have hitherto been much divided, I trust I shall be forgiven for omitting the mention of many valuable additions lately made to our literature on this important subject. A hope is entertained, however, that the treatment recommended, especially as it regards the use of the caustic and sarsaparilla, will be found abundantly satisfactory in the practice of others. Some cases may certainly get well by the use of either, but the curative process will more certainly be accelerated by the combination.

From the London Medical and Physical Journal.

Case of Inflamed Vein and extensive Phlegmonous Erysipelas of the Arm, following Venesection, treated by incisions. Under the care of Mr. EARLE, at St. Bartholomew's Hospital.

Margaret Gearing, æt. twenty-four, a maid servant, presented herself as a casualty patient on the 28th of July, 1827. She stated that she laboured under a suppression of the catamenial discharge, and requested to lose blood, from which she always experienced immediate relief. She was bled by the dresser, and no more was heard of her till the afternoon of the 30th, two days after venesection had been performed: she then stated that, on the evening of the 29th, her arm became uneasy, which induced her to remove the bandage,

and, upon examining the wound, she found it somewhat festered, and painful to the touch. She applied a poultice, and took a little opening medicine. On the 30th, she felt exceedingly unwell, her arm becoming more painful, and she begged to be admitted into the hospital.

The following symptoms were observed:—The arm, about the elbow joint, is a little swollen and painful on pressure; the wound in the vein is open, and contains a small quantity of pus; the vein is also thickened around the puncture, and upwards to the extent of half an inch; red lines, extending in the course of the absorbents, can be distinctly seen. Her countenance is anxious; skin hot and dry; pulse 100, and hard; tongue furred; bowels somewhat confined. V.S. ad 3xvj. (which produced syncope.)—Hyd. Submur. gr. iij.; Pulv. Antimon. gr. v. statim.—Mist. Salin. cum Mag. Sulph. 3j. quartis horis.—Cataplasma panis brachio.

July 31st, at eight A. M.—She was seen by Mr. Earle. The arm was now greatly swollen; erysipelatous inflammation extending from six inches above the elbow joint to the wrist; the integuments were tense and exceedingly painful. She complained of pain extending towards the axilla, the glands of which were tender to the touch. The constitutional symptoms are aggrivated; pulse 100, rather more compressible. Blood drawn yesterday not buffed.

Mr. Earle stated that, unless the inflammation and tension of the limb were soon relieved, extensive sloughing of the cellular membrane would, in all probability, ensue. With the view of preventing an occurrence so likely to endanger the life of the patient, he immediately made two incisions, of about three inches in length, along the upper part of the forearm, extending down its radial side: these incisions extended down to the fascia; the cellular membrane did not appear to have yet undergone any change, but was exceedingly vascular, and cut crisp. About ten ounces of blood flowed from these incisions in the space of two hours. She expressed herself as being much relieved. Tension of the limb somewhat subsided, nor is it so tender to the touch. The arm to be well fomented.—Continue the Saline Mixture, with Sulph. Magnesiae.

August 1st.—She had passed a more comfortable night: pain, tension, and redness of the limb has entirely subsided. The constitutional symptoms are, however, yet severe: pulse ninety-six, and hard; tongue furred, with much pain in the head; skin rather hot; bowels inclined to be costive. V.S. ad 3xij.—Haust. Sennae statim.

2d.—Feels much relieved. The arm is now of the natural size. The blood drawn yesterday was buffed. Ordered Mist. Salin. cum Potassae Nit. gr. viij. quartis horis.

Ten P. M.—She feels very uneasy; there is increased heat about the carpal extremity of the forearm, which is tender on pressure. Ordered Hirudines xij. brachio. Postea Cata-

plasma panis.—Calomel gr. iij.; P. Antimon. gr. v. statim.—Contr Mist. Salin. cum Pot. Nit.

3d, eight A. M.—She is much worse. The inflammation is extending up the forearm; the integuments about the wrist and back of the hand are exceedingly tense and painful; countenance flushed; skin hot and dry; tongue furred, and bowels costive. During the night she had a smart attack of shivering. The patient strongly urges that another incision may be made. One of four inches in length was accordingly made on the outer side of the wrist; a small quantity of pus was seen oozing out with the blood which flowed from the wound; a small portion of cellular membrane at the lower part of the wound looks in a sloughy state. About four ounces of blood were lost from this incision. The patient felt immediate relief. The arm to be well fomented; after which, let it be covered with a bread poultice.—Calomel gr. iij.; Pulv. Jalap. gr. xv. statim.—Continue Mist. Salin. cum Pot. Nit.

4th.—All unfavourable symptoms have left her. The arm is quite free from inflammation; the integuments have resumed their natural appearance. Bowels have been well opened by the Calomel and Jalap; pulse very feeble; the wounds are looking remarkably healthy. Continue the poultice.—Ordered Inf. Cascar. 3jss.; Tr. Card. c. 3j. ter die.—Strong broth diet.

10th.—She is gradually regaining her strength. The two upper wounds have nearly healed; a portion of cellular tissue has sloughed away from the lower one, which in all probability is the cause of its not healing so readily as the other incisions. Contr med.

19th.—During the night she had an attack of fever, accompanied with severe pain in the head; tongue furred; skin rather hot; complains of thirst. Applic. Hirud. x. temp.—Ammoniae Subcarb. gr. xv.; Acid. Citric ʒj.; Mist. Camph. 3jss. quartis horis, in active effervescence.

The two upper incisions have cicatrised. Another small portion of sloughy cellular membrane was removed to-day with a pair of forceps from the lower one.

21st.—Passed a comfortable night, and is much better. Contr med.

23d.—Not so well. Febrile symptoms have again returned; complains of nausea and headache. Ordered Calomel gr. iij.; P. Antimon. Tart. gr. j. statim.—Mist. Salin. cum Pot. Nit. quartis horis.

24th.—The medicine has produced several copious evacuations, of a dark colour. Feels greatly relieved. Contr Mist. Salin. cum Pot. Nit.

29th.—The lower incision has now quite healed; she has perfect use of the limb. Her health rapidly improves. Ordered Sulph. Quinine gr. ij. cum Inf. Menth. Sulph. ter die.

30th.—She was discharged quite well.

Remarks.—Mr. Earle considered this a well marked case of phlegmonous erysipelas, and an illustration of the good effect of incisions in the early stage of this disease. That these incisions will relieve the tension and pain of

the part, and prevent the sloughing of the cellular membrane, this case alone will exemplify; for we find that where the incisions were made in the upper part of the arm, no sloughing of the cellular membrane took place, while at the lower part of the arm this process was not altogether prevented, from an incision being made at a later period of the disease: and there is little doubt but that this last incision prevented the further progress of mischief.

From the Medico-Chirurgical Review.

LARYNGITIS. By M. MARTINET. *Hôtel Dieu.*

In a short clinical report, published by Dr. Martinet, in a late number of the *Révue Médicale*, an interesting case is detailed, of which we shall give the particulars in this place.

1. *Angina Suffocans.* The author avoids entering into the discussion, whether croup be a disease essentially different from cynanche laryngea et trachealis. The angina suffocans is an inflammation about the top of the air-passage, and presents some differences, according as the inflammation is seated in one or other part of the larynx or its appendages. The alteration of the voice, the sound of the cough, the distressing paroxysms of suffocation, the kind of expectoration, (when there is expectoration) suffice to characterize *cynanche laryngea* and *cyn. trachealis*; while, on the other hand, the tumefaction and redness of the velum palati, tonsils, and pharynx, together with the presence of crusts and exudations of different sizes, on these parts—the difficulty, or even impossibility, of swallowing—the regurgitation of liquids through the nose, these will readily mark the existence of cynanche pharyngea and tonsillaris. Oedema of the glottis may be suspected, when there is a sensation as if a foreign body were placed in the throat, and more especially when, by the finger, a kind of ring or ridge is felt surrounding the rima glottidis—attended with extreme dyspnoea. But often there is a complication of all these affections in the same subject.

In some instances, the angina suffocans does not show unequivocal characters of *inflammation*, and then our practice is necessarily embarrassed—some trusting to depletion, some to calomel, and others to emetics and counter-irritation. In this state of vacillation as to the best method of treatment, the patient often dies by the rapidity of the disease, and the derangement which some of the most vital functions in the body experience. The following case will show the path which we ought to pursue, where the subject is young and vigorous. It will also demonstrate the power of art over one disease at least.

Case.—Peter Chapon, 26 years of age, of vigorous and sanguineous constitution, came into Hôtel Dieu on the 11th March, being that day seized with acute pain in the throat, about the top of the larynx, quickly followed by difficulty of breathing, and sense of suffoca-

tion. Eight ounces of blood were taken from the arm, but the sense of suffocation continued, and made progress, without increase of frequency in the pulse, or elevation of heat on the surface. *Thirty leeches* were applied round the neck, and, the same evening, venesection was repeated to *twenty ounces*. The dyspnoea was relieved by this last bleeding, and the sense of suffocation rendered less imminent. *Mustard pediluvia.* 12th. The pain at the top of the throat is still acute—the voice is altered from its natural tenor, being much weaker—respiration difficult and sonorous, but not accompanied with much sense of suffocation—tumefaction of the tonsils and uvula—no appearance of albuminous exudation on any part of the fauces—the deglutition is difficult—pain on pressure of the larynx. Some of the physicians, on introducing the finger, thought they felt a swelling about the rima glottidis. There was an expuition of reddish and sanguinolent saliva—pulse easily compressible and very little increased in frequency—heat moderate—countenance indicative of anxiety—great prostration of strength—face neither pale nor flushed, but the circulation apparently impeded—inability to deviate from the upright posture. *Venesection—blister to the nucha—purgatives—sinapisms to the lower extremities.* This day passed, like the preceding, in a state of constant dyspnoea, with occasional paroxysms of sense of suffocation, not, however, so threatening as to require tracheotomy. *Sixty leeches* were applied round the neck, and a cataplasm over the bites. 13th. The sense of suffocation is diminished, and the patient can fill the chest by a deep inspiration—expectoration very difficult but changing in character to the muco-purulent form. *Twenty more leeches to the neck.* On examination with the stethoscope, the breathing was heard much more distinctly in one side of the chest than in the other, and the *râle muqueux* indicated inflammatory action of the mucous membrane of the bronchia. From this time, the expectoration became freer, and the dyspnoea less, until convalescence was established.

Remarks.—The above is a good sample of that dangerous disease laryngitis. The depletion, except in the first instance, was bold and decided; but the Hôtel Dieu physicians deprived themselves of a powerful means of checking the inflammatory action, by withholding nauseating doses of antimony and calomel, which increase the intestinal secretions, and save a great deal sanguineous depletion.

From the Medico-Chirurgical Review.

CURIOUS SPECIES OF CEREBRAL HEMORRHAGE. By M. BRAVAIS. *L'Hospice de Bicêtre.*

There is, says M. Bravais, a disease of the cortical substance of the brain, to which anatomists and pathologists have not directed sufficient attention. It is a hemorrhage which generally occupies the whole of the cortical substance of the brain, giving place, first, to

the formation of small globules of blood, mixed with a nervous pulp, and afterwards producing yellowish cicatrices, extending from the external coverings of the brain down to the medullary matter. This lesion has an intimate connexion with cerebral hemorrhage. The symptoms, at all times obscure, have not been distinguished when the disease was bounded to a small portion of brain. They are such as appertain to congestion and softening of the cerebral substance. Sanguineous effusions into the cortical structure are described by all authors; but M. Bravais has not seen any description answering to those yellow membranous-looking cicatrices which are now to be delineated.

Case 1.—Pinard, aged 32 years, presenting, for several years, the symptoms of sombre melancholy, was observed to become rapidly emaciated during the last month of his life, and he complained much of pain in the right side of the chest, without any expectoration. He refused his food, and died on the 5th April, 1824.

Dissection.—There was a moderate proportion of blood in the sinuses and meninges of the brain—very little serosity on the surface of the hemispheres—or in the ventricles. The arachnoid and pia mater were transparent, and easily detached from the surface of the brain. In the posterior lobe of the left hemisphere was found a crude tubercle, of small size, which readily turned out with its investing membrane. Around this tubercle, the cortical substance of the brain was reduced to a pulp, of a dark colour, in which the debris of the cerebral structure was discernible, mixed with some globules of blood. The rest of the brain preserved its usual consistence. The lungs, especially on the right side, were filled with miliary tubercles, and the bronchial glands were tuberculous.

The narrator thinks it evident, that the cerebral tubercle, and the hemorrhagic condition of the surrounding part, came on in the latter state of this man's existence, and had nothing to do with the melancholic affection under which he so long laboured. Of this, we do not see the evidence so very clearly. Knowing the slow growth of tubercles generally, we do not see any reasonable doubt, that the one situated in this man's brain may have contributed to the disturbance of the sensorial functions.

Case 2.—Dupille, aged 50 years, entered the Bicêtre, on the 15th May, 1824, with the following symptoms:—Delirium, loquacity, constant motion of his limbs. The strait waistcoat was applied. 20th May. Considerable dyspnœa—delirium—coldness of the extremities—feeble and quick pulse—puriform expectoration with his cough. He died on the 29th May.

Dissection.—The meninges of the brain were perfectly natural, and the pia mater was easily detached from the subjacent cerebrum. There was a portion of cerebral substance, however, at the under part of the middle right lobe, which was completely impregnated, as

it were, with blood, the nervous pulp and blood being intimately mixed. This was in the cortical substance:—The medullary portion underneath was quite sound. In the thorax, a pint of limpid serum was found in the right side—in the left, a pint and a half of sanguinolent watery fluid. There was not any material disease of the lungs, except in one place. The pericardium adhered at one spot, by a false membrane, to the heart. The substance of the heart was soft, and easily lacerable, especially the left ventricle, which tore in two places, merely while handling it.—*Révue Médicale.*

It is evident that the thoracic affections, in this case, were quite sufficient to destroy life. The cerebral hemorrhage does not appear to have produced either convulsions, or loss of sensibility or muscular power.

A considerable number of other, and nearly similar, cases are related, but we think the above are sufficient to attract the attention of pathologists to this particular lesion of the brain.

From the Medico-Chirurgical Review.

GANGRENE OF THE FEET FROM OBSTRUCTED AORTA.

Case.—Count C——, aged 66 years, of athletic constitution, keen appetite, and a very hearty eater, had always kept himself in a state of plethora, with tendency to cerebral congestions and gastric irritation. From these affections he was usually relieved by sanguineous depletion, especially leechings; but his appetite being too powerful, he was never sufficiently guarded in his diet. In the autumn of 1826, the Count became subject to an unpleasant sensation of heat in his feet, particularly when walking, which obliged him, after a promenade, to put his feet on cold marble to allay the heat. In the month of December, of the same year, the patient was seized with acute pain in one of his hams, which was removed by leeches. Next day, the pain settled on the tendo-achillis and neighbourhood, and appeared of a gouty nature, there being some swelling and redness. One evening, after a rather too free dinner, and a glass or two of strong wine, the pain became greatly exasperated, attended with quick pulse and hot skin. Leeches were applied without relief, and an attempt was made to bleed from the arm, but without success. The pain increased—delirium came on—with constant jactitation, and screaming. On examining the part, some vesications were seen, and soon afterwards gangrene manifested itself unequivocally. A troublesome hiccup now supervened, and could not be stopped. In the course of a few days the gangrene had invaded the whole of the leg—the patient became comatose—black spots appeared on the other extremity, and death closed the scene.

Dissection.—The heart was found enveloped in a thick layer of fat, and intimately adherent to the pericardium throughout. The organ was flaccid, softened in structure, and

its cavities dilated. The semilunar valves of the aorta were ossified, and the vessel itself considerably dilated, especially at its arch. About an inch and a half below the origin of the cœliac artery, the aorta became completely ossified, and its bore almost entirely obliterated. There were only two small passages for the transmission of blood, not more than half a line in diameter each. The iliac arteries were also interrupted, and nearly obliterated in several places. The femoral, or rather the inguinal arteries, about the crural arch, were rather dilated, thickened in their coats, and much ossified. Below the crural arch, the left femoral artery was merely thickened, whilst that of the other side was red, and filled with clots of different degrees of consistency. The vessels of the mortified parts participated in the condition of the surrounding soft tissues. The veins of the lower extremities were thickened, and obstructed. There were various marks of inflammation and thickening in the stomach and bowels, with considerable serous infiltration into the ventricles and between the membranes of the brain.—*Broussais' Journal*.

Remarks.—It appears that the Count had been blind for several years, without any appreciable lesion of the optical apparatus. In the examination of the brain, it was found that the tubercular quadra-gemina and the optic nerves were not more than one half their natural size. The propensity of the Count to good eating and drinking has been observed. The state of the stomach accorded with this propensity. The mucous membrane was in a state of hypertrophy, and presented a remarkable contrast with the state of atrophy in which were found the optic nerves. The obstructions in the aorta, and in other parts of the arterial system, were owing, in M. Broussais' opinion, to a general inflammatory condition of the vascular system. The gangrene of the lower extremities was also, no doubt, the result of this obstruction to the regular supply of blood to those members.

From the London Medical Repository.

DEATH BY SUBMERSION.

The following is the substance of a memoir, of great medico-legal interest, which was read by M. Orfila at a recent meeting of the Académie Royale de Médecine. The object of the author is to ascertain what are the signs peculiar to death occasioned by submersion; a question on which writers have hitherto been much divided. 1. The livid, suffused, and bloated appearance of the face, with frothy slaver in the mouth and nostrils, which some have considered to be sure signs of death by drowning, are rejected as such by M. Orfila, because they are often wanting in drowned bodies, and occur frequently in other kinds of death. 2. Thus, too, the great paleness of skin is more an effect of prolonged immersion than of the kind of death. 3. Excoriation of the fingers, and traces of mud or dirt under

the nails, prove but little: they are not found in those who have died before they touched the bottom of the pool or river; and again, they are found on corpses which, before falling into the water, shall have come in contact with any harsh or dirty substance. Besides, after long immersion, putrefaction of the parts has proceeded so far as to confound all marks of excoriation, as well as those of mud and dirt; the epidermis and the nails peel off. 4. The injected state of the meninges is a fallacious sign: all drowned bodies have it not, while other corpses have. Nevertheless, we should not overlook this appearance, if it were proved that the corpse grew cold in the vertical position. 5. In most of the drowned, the right cavities of the heart, the veins, and pulmonary arteries, are distended with black blood; the arterial system, on the contrary, if not altogether empty, as Curry affirms, is at least much less full. The right ventricle, too, is of a blackish brown, the left of a clear rose colour; and the right cavities retain a contractility far exceeding that of the left side. But, not to mention that these phenomena are observed in many other kinds of death, we may see the parietes of the heart readily change colour, and become brown by contact with the blood; and, in order to witness the greatest degree of irritability in the right cavities of the heart, we should open bodies soon after submersion. 6. The blood is found fluid in almost all the drowned; though an unaccountable exception obtains in dogs so deprived of life: yet this fluidity occurs in several other kinds of death; and even in cases of drowning, Lafosse long ago, M. Avisard recently in two instances, and M. Orfila himself in another, found the blood coagulated. 7. It has been said that the drowned die in the act of inspiration, and therefore have the diaphragm depressed, and the ribs elevated: common reflection alone might have refuted this assertion, if M. Orfila had not positively contradicted it, after the examination of above fifty drowned bodies. 8. By the experiments of MM. Edwards, Jenner Cox, Piorry, and Orfila, the early influx of water into the stomach during submersion, and its entire absence in cases of death preceding submersion, is now well established. So that, if the stomach contain water, which is identified with that out of which the corpse was taken, a probability results that submersion was the cause of death. At the same time, it should be ascertained that this water was neither swallowed before death, nor injected into the stomach afterwards. 9. As to the state of the respiratory tubes, the remark of M. Detharding, that after drowning, the larynx is found closed by the epiglottis, is not true; and the appearance of froth in the trachea affords very uncertain evidence, being neither universally present nor permanent.

The only absolute proof of submersion having been the cause of death will be the presence of water in the extreme ramifications of the bronchia—but with these reservations, that the contained water is the same as that in which submersion took place, that it

has not been injected after death, and that it could not have entered in consequence of the vertical position of the corpse. Owing, however, to the attempts at inspiration, water penetrates farther into the lungs before death than it can afterwards.

Unfortunately, it is difficult to detect water in the pulmonic issue, unless it be coloured, or turbid with mud, which is so rare a case, that M. Orfila has only met with it in one out of the many bodies of the drowned that he has examined. And here we are warned against mistaking for sand or gravel the particles of food, which, rising from the stomach into the fauces, may have subsequently passed into the trachea. This phenomenon has frequently been observed in the drowned, even where no putrefaction had yet commenced. M. Orfila then adds, that the absence of water in the bronchia, and of froth in the trachea, is accounted for in various ways; so that nothing is thereby proved against fatal submersion. In conclusion, he adverts to a remark of M. Piorry, that while in all sudden deaths the bladder is empty, it is found full in dogs that have been drowned. M. Orfila attributes this fact to absorption of water which has penetrated the bronchial ramifications; but he is not disposed to receive it in evidence—for, according to the experiments of M. Piorry, this fulness of the bladder disappears as the body becomes rigid; and rigidly comes on soon after drowning, in consequence of the rapid refrigeration of the body by the cold water.

At the suggestion of M. Itard, the meeting ordered the work of M. Orfila to be published.—*Revue Médicale.*

From the Medico-Chirurgical Transactions.

ON THE USE OF THE SULPHATE OF COPPER IN CHRONIC DIARRHŒA. By JOHN ELLIOTSON, M.D. Cantab. Fellow of the Royal College of Physicians, and Physician to St. Thomas's Hospital.

On Thursday, October 13th, 1824, I admitted into St. Thomas's Hospital, an Irishman, named Garret Welsh, twenty-four years of age, who had been labouring under diarrhœa for three months.

The abdomen was tender on pressure, the pulse quick, the skin hot, and the tongue foul and dry. The motions were yellowish and watery. I ordered a very large blister to be applied over the abdomen, half a grain of opium to be taken night and morning, with chalk mixture, and the diet to consist of milk.

In a few days the tenderness was much diminished, but the diarrhœa continued. Powdered catechu was added to the mixture, and taken every six hours, and the blister was repeated, but without good effect. Infusion of galls was now made the vehicle of the catechu, and instead of the solid opium, taken latterly in a dose of one grain, night and morning, $\frac{1}{2}$ of the tincture was given in such astringent draught, a third blister was applied, and as

considerable debility and emaciation had taken place, animal diet was substituted for the milk.

The 30th of November had now arrived, and though there was no pain or tenderness, the diarrhœa was as profuse as ever, and the man appeared likely to sink. Mr. Henry South, one of the pupils, mentioned to me that two cases of the successful exhibition of sulphate of copper and opium in diarrhœa, had recently been related in the Physical Society of Guy's Hospital, and I instantly resolved to profit by his information, and prescribed half a grain of the sulphate of copper twice a-day, with two grains of opium, so that the quantity of the latter might be much the same as what had previously been taken in the twenty-four hours. In a few days the disease was evidently less severe, and in eleven from the commencement of the use of the copper, was so much abated, and the man's appearance and strength so much improved, that I ventured to diminish the opium to one grain, increasing, however, the dose of the copper to one grain, lest the disease should gain ground again, and that I might fully satisfy myself which of the remedies had the greater share in producing the benefit. In a week more the disease had so diminished that I ventured to omit the opium; and in another the man felt so strong, and found his disease so inconsiderable, that he would stay no longer in the hospital, and was made an out patient.

This case made a great impression upon me, because two powerful astringents in common use, combined with opium, had previously failed, and the benefit clearly arose from the sulphate of copper, and not from the opium, which I exhibited with it solely for the purpose of preventing the acrid quality of the salt from counteracting its astringent effects upon the intestines.

On December 8th, 1825, I admitted a sailor, named Peter Hurly, aged 48, who had been affected many weeks with the form of diarrhœa so accurately described by Dr. Baillie, in the fifth volume of the Transactions of the College of Physicians. The description is preceded by the remark, that it "is not very generally known, and is almost constantly fatal." Dr. Baillie states, that it occurs more frequently in men than in women, and generally in persons who have long resided in hot climates; that the stools are very copious and numerous, pale, like a mixture of water and lime, frothy, and often of a sour smell; but if they acquire the consistence of pudding, they are still pale; and if they become figured and dark, the colour is rarely so deep as in health, and they soon again become white and frothy; that the body is thin, and the countenance sallow; that there is no tumefaction or pain of the abdomen; and that though the disease may continue several years, and be occasionally less severe, it almost constantly in the end exhausts the constitution.

The present patient was a *man*, and had lived much in *hot* climates; was *thin* and *sallow* and had gradually lost his flesh and strength; his motions very frequent and *copious*; liquid,

white and frothy: he had *no swelling* of the abdomen, *nor tormina*, *nor pain upon pressure*.

I ordered half a grain of sulphate of copper, with one grain of opium, to be taken twice a-day; and his diet to consist of milk, arrow root, strong beef-tea, and a little wine. In four days the dose was increased to one grain. He had not taken this quantity above five days before the stools were reduced to two or three in the twenty-four hours, and they were never afterwards more numerous, except for one day, probably from some accidental circumstance. In a few more days they became thicker, and from that time there was generally but one in the twenty-four hours. On the 3d of January, rather less than four weeks from his admission, they assumed a deep healthy yellow—an occurrence rarely, if ever, witnessed by Dr. Baillie,—and they continued of this colour. They however became liquid again, and I augmented the dose to one grain and a half; and this not rendering them consistent, I augmented the dose after eleven days to two grains. Some pain was now felt in the epigastrium, and a blister was applied without benefit; and as it appeared to arise from the acrimony of the salt, the dose of opium was made *gr. iss*, with the effect of removing it entirely. The man found himself so strong that he desired to be discharged on the 2d of February. He had now gained flesh, and now passed but one motion in the twenty-four hours, solid, and of a healthy appearance. He took with him a supply of medicines for a fortnight.

This case is particularly satisfactory when compared with Dr. Baillie's experience. "The influence of medicine," he says, "is generally very inconsiderable. Patients will sometimes receive advantage from very small doses of mercury, which will sometimes stimulate their liver to a better and more plentiful secretion of bile, without impairing the strength of their constitution. Some advantage too is occasionally derived from the different kinds of bitter medicines, as *cascarilla*, *cusparia*, &c. combined with a few drops of laudanum. A medicine of this kind, taken twice a-day, will sometimes improve the digestion, when it is deficient, will render the motions more solid and less frequent, and increase the strength of the constitution: but this good effect is hardly ever permanent, for the patients almost constantly fall back into a state of frequent and frothy stools. The repeated returns of the complaint at length wear out the constitution, and the patients sink."

The stools of this man became highly bilious, without the exhibition of a grain of mercury, and acquired not only a biliousness, but a consistence never, I should imagine, witnessed by Dr. Baillie; and this permanently. His strength and flesh were restored, and not by general tonics, but by the removal of the disease.

Although the opium must have been useful, the great benefit cannot be ascribed to it, because Dr. Baillie gave opium with such results as we have seen, and because the stools did

not become consistent till the dose of the copper was increased.

The following case is one of dysenteric diarrhœa.

John Roberts, aged 39, was admitted April 14th, 1826.—He had been frequently in North America, but in England ever since October. He had laboured for three months under severe purging, the stools being bloody, and amounting to about twelve in the day and night, with tormina and tenesmus. At present the stools were generally thin and yellow, though often bloody and slimy.

I ordered him one grain of sulphate of copper, and one grain of opium, twice a-day. The day after his admission the stools were reduced to five. In three days more they had increased to seven or eight. The medicines were therefore given three times a-day; and there being no amendment at the end of a week, the dose of the copper was increased to one grain and a half; in another week to two grains; and in three days more (now three weeks since his admission,) to two grains and a half, as the stools varied from six to nine in the twenty-four hours, and were frequently liquid; though a sufficient quantity of solid healthy fœces was daily discharged; he had experienced no tormina nor tenesmus since his admission, had grown strong, and gained flesh. In ten days the dose was raised to three grains, the opium remaining all along at the original quantity. In a week from this period the stools were reduced to three, and in a few days more one only was passed in the twenty-four hours.

He left the hospital June 1st, with a supply of medicine, perfectly well and grown fat, though he had taken only the house allowance of meat every other day, and table beer.

Notwithstanding his stools had been generally bloody and slimy for three months previous to his admission, they were never so during his stay, nor did he ever experience the tenesmus, and but once the tormina.

The following was a case of long and severe diarrhœa.

A Swede, named John Nelson, aged thirty-six, was admitted January 19, 1825. He had been left by his ship, with eight others, on a desolate island in the Indian Ocean, where he remained four years and three months; then went to the Isle of France, and was attacked with dysentery which ceased at the Cape, and returned at Amsterdam. He had now suffered from diarrhœa six months. The motions amounted to twelve in the day and night, were yellow, and attended with pain and scalding.

The sulphate of copper was prescribed in the quantity of one grain, with one grain of opium twice a-day. The dose was augmented to one grain and a half, and subsequently to two grains; and at length one grain and a half, with but half a grain of opium, was given three times a-day. From this time the motions were less copious, and their number in a few days was reduced to two or three in the twenty-four hours, and on March 14, he was considered perfectly well, though he remained some time

longer in the house on account of a diseased tibia.

The next case illustrates the use of the remedy after the failure of others.

A man, named Henry Hurle, aged thirty-seven, was admitted October 6, 1825, on account of frequent bloody and mucous stools, under which he had suffered for five weeks. He had been in the Brazils, the West Indies, North America, and the Mediterranean, but had resided in England for nine years, and worked last at the iron works in Wales.

He was ordered one scruple of hydrargyrum cum creta and one grain of opium twice a-day. The quantity of opium was increased to one grain, to one grain and a half, and finally to two grains; and a half a pint of dec. hæmatoxyli was drunk daily.

On the 15th of November he had not improved, and I prescribed half a grain of sulphate of copper, with but one of opium. The dose of the salt was soon increased to one grain, and that of the opium to one grain and a half.

He was discharged perfectly well on December 22.

Another man, named Aaron Newman, aged thirty-five, who had been in the West Indies, and attacked with dysentery there, was admitted March 23, 1826, for profuse diarrhœa of eight months' standing.

He took one grain of the sulphate of copper, twice a-day, with one grain of opium; then one grain and a half; and then this quantity, with the original dose of opium, three times a-day; and left the hospital quite well April 27.

The last with which I will trouble the society, was one of four years' standing, but at intervals. The man, named John Mundy, was thirty years of age, and the stools were bloody, and not fewer than ten every day.

I prescribed one grain of the sulphate of copper, with one grain of opium, twice a-day.

In five days, as he was no better, he took his medicines three times a-day, and in four more, the dose of the salt was increased to one grain and a half. In a fortnight the stools were reduced to two or three in the day and night, and they never afterwards exceeded this number; they also ceased to be bloody, though formerly they were invariably so. The dose of the salt was augmented to two grains and a half; the motions acquired consistence and their natural frequency; the man felt well and strong, and was discharged on the 18th of May.

I could greatly extend this list, but the narration of cases is always tedious, especially when they are so similar, as such must necessarily be to each other; and the preceding sufficiently illustrate the power of the remedy. I will therefore content myself with mentioning the general results of my experience during the last two years and a half in St. Thomas's Hospital, where a great number of sailors are admitted labouring under intestinal affections consequent upon dysentery in hot climates.

I am satisfied that the sulphate of copper is superior to every other astringent in chronic

diarrhœa,—that it will cure the disease more quickly than any other, and often when all others fail.

Three grains three times a-day is the largest quantity I have prescribed; but this I have frequently given. The dose usually borne and required varies from a grain and a half to three grains. It may be taken for an indefinite time without any fear of constitutional ill effects.

I had two very severe cases, in which the quantity of blood and matter in the evacuations, and the wretched appearance of the countenance, rendered the existence of great disease of the inner surface of the intestines probable, and which would most likely have proved fatal but for the remedy. It arrested the complaint after a time, but such had been the severity of the disease, and so much reason was there for apprehending mesenteric affection, and thickening of all the substance of the intestines, that, if it was omitted for a week, the diarrhœa in some measure returned. These patients took it between three and four months, in doses of two and three grains three times a day, with no other effect than that of controlling the disease, and improving the appearance in a degree which surprised every one.*

It certainly has a tendency to produce vomiting and griping. On these accounts I have always combined it with opium, and never but in the first case, and then only for a week and at the cessation of the disease, ventured to exhibit it alone.† No inconvenience resulted, and I have generally found a grain and a half of opium sufficient to prevent even three grains from griping in the least. Notwithstanding the unquestionable co-operation of the opium with the sulphate, the far superior share of the salt in curing the disease has been repeatedly proved by the previous failure of opium alone, or combined with other astringents, and by the dose of opium being actually diminished when the copper was superadded.

The disposition to occasion sickness is much diminished by administering it, like all medicines inclined to disagree with the stomach, and intended to pass the organ without sensible effect, in the form of pill and after food has been taken. A dose of it, as well as of oxymuriate of mercury or tartrate of antimony, which would cause sickness, if taken in a liquid form or before breakfast, will be borne perfectly well, and frequently indeed a much

* July 21, 1827. I take advantage of the interval which has elapsed before the paper is printed, to add that these men have both recovered, after taking the medicine about six months. Without it, I am convinced that they would gradually have sunk.

† With the first of the patients mentioned in the preceding note, I gradually lessened the quantity of opium till it was omitted altogether, and he took three grains of the sulphate alone three times a-day, for the last six weeks that he was in the hospital.

larger dose, if taken in the form of pill and after a meal.

In thus recommending a medicine for a purpose which, as far as I know, has not been mentioned by any author, I am anxious, as upon every such occasion, however great its excellence, not to excite too high an expectation,—not to appear pretending that it is universally applicable, and that it never fails. In cases only in which astringents are proper is it proper; and although ulceration of the inner coat of the intestines, and very extensive ulceration, will heal,* and the sulphate of copper will contribute to the cure more than any other medicine, the mischief may be irremediable by any measures; and, on the other hand, chronic diarrhœa is frequently kept up by the state of mind, by the mode of living, or by the residence. No medicine can alter these, and I knew two examples of the failure of it and all other remedies, when a removal from town cured the disease in a few days, and a return to the metropolis was invariably followed by a return of the diarrhœa.

From the *Lancet*.

ANATOMICAL AND PHYSIOLOGICAL
REMARKS ON THE MEDULLA OB-
LONGATA. By Dr. MEYRANX.†

It is known that the medulla oblongata is that part which extends from the commencement of the spinal marrow to the corpus striatum. About the middle of its extent, it is surrounded by a circle formed by the cerebellum superiorly, and by the pons Varolii inferiorly. The medulla oblongata has been submitted to experiments in the different parts of this space, and different functions have been ascertained to belong to its successive portions. The protuberance, as well as the cerebellum, which forms the circle of which we have just spoken, divided by an imaginary line which would fall vertically from the centre of the vermiform process to the centre of the protuberance, give two lateral segments, in each of which there exists, according to M. Magendie, a force which impels the animal to turn on the opposite side. These two forces, reciprocally balancing each other, constitute the equilibrium preserved in the standing position. By wounding a hemisphere of the cerebellum, or a half of the protuberance, the equilibrium is destroyed; the animal rolls over on its side, until some mechanical obstacle stops it; this rolling commences on the side injured. To this very singular phenomenon is added, a particular position of the globes of the eyes; that on the

injured side being turned downwards and inwards, and that on the other side upwards and backwards. These symptoms are the more marked, as the injury approaches the nearer to the protuberance.

M. Magendie thinks, that below the cerebellum there is another double force, which exists throughout the lateral half of the medulla oblongata; if it be cut transversely, on a level with the fourth ventricle, the animal turns on its feet, and always on the side opposite the injury, with as much precision as a horse goes through the exercise of the riding school.

The same physiologist did not perceive any effects to result from wounding the anterior pyramids, until one of them was cut, together with the entire moiety of the medulla oblongata to which it belongs, and until the medulla oblongata had been divided by a longitudinal section on the median line. After these two operations, he observed that the voluntary motions only were paralysed; this paralysis affected the opposite side of the body.

M. Magendie has never observed any consequence to result from wounding separately one of the posterior or one of the anterior pyramids. We are now about to give a short account of some disorganizations produced in the same parts, accompanied with very marked appearances, and somewhat different from those hitherto observed.

But before detailing these experiments, we think it necessary to remark the number and disposition of the bundles of the medulla oblongata; the situation of the anterior and posterior pyramids, or the corpora restiformia, is known. Between these two last, two longitudinal columns, almost parallel, are observed on the floor of the fourth ventricles, but which do not separate from each other at an angle, like the corpora restiformia; they are covered, especially in man, with a gray layer, below which is situated a white matter, forming a mass of considerable thickness, if that of the anterior pyramids be comprehended. This gray layer, and the subjacent white matter, are generally taken for the posterior surface of the anterior pyramids, but it is an error; it is, in fact, a third bundle, which is perfectly distinct from the two others, and which is called the bundle of the infundibulum, because in the four classes of vertebrated animals, it arises from the corpora albicantia, which always occupy the sides of the infundibulum. It is the junction of these two bundles, that forms that triangular space which is situated between the crura cerebri; this space is bounded anteriorly by the infundibulum, and posteriorly by the tuber annulare,—though superiorly, on one side of the brain, this triangular layer is continuous with the tuber annulare, then with the anterior pillar of the cerebral triangle; and posteriorly, the substance of this same triangular layer is prolonged into the surface of the fourth ventricle; covered by the point of the *calamus scriptorius*, it re-appears below those limits, at the posterior lateral parts of the spinal marrow.

* Instances may be found in the writings of Dr. Andral, in Dr. Peter Latham's work upon the disease of the Penitentiary, and in the *Journal Général de Médecine* of last year. The most extensive, I believe, is related in Mr. Howship's book on Morbid Anatomy:—a very long tract of ulceration was found healed.

† *Annales des Sciences Naturelles*.—Aôut, 1827.

We think that this is the bundle mentioned by Mr. C. Bell, to which he refers the nerves of the respiratory system. It cannot be followed lower down in the substance of the spinal marrow, such is the intricacy of this part, or at least this investigation can only be made in the *foetus*. The anatomical part which we have just specified, is not very easily discriminated in the adult, but is made very evident by a vertical section along the whole length of the spinal marrow of a new-born child, but still more so at the age of three months and a half. The reason of this is, that, at this period, the the nuclei of the three bundles in question are white, and all the other parts are gray.

It is on the bundle of the infundibulum that a great part of the glosso-pharyngeal and par vagum arise; lastly, the sympathetic derives a very distinct root from it; it is that which the lateral bundles of the *valvula vieusseni* furnish. These last bundles are a part, or continuation, of the posterior cords of the medulla. These details are necessary to understand the motion of the eyes, to which we shall allude in the following experiments. It is known that Mr. C. Bell has proved, that the two obliqui, to which the fourth and a filament of the third pair go, fulfil the functions in the involuntary motions of the eye, functions related to those of respiration.

In our first experiment, we laid bare the brain of a young rabbit, and raised the greater part of the left hemisphere, without any other symptoms except blindness of the right eye.

At the end of half an hour we determined to wound the thalami nervorum opticom, which was concealed till now by the posterior part of the hemisphere. The scalpel having been plunged into its direction, the animal carried its head strongly backwards, then brought it to the position just described, but the equilibrium was lost; the eye on the injured side was fixed downwards and inwards, the eye on the opposite side was fixed in an opposite direction; the whole of the cervical region was flexed obliquely on the side injured; lastly, it rolled over, commencing on the injured side, and continued turning until stopped by some mechanical obstacle. The rest which accompanied this motion, always took place on the healthy side. We recognised the symptoms described by M. Magendie, and we thought we had wounded the left side of the protuberance.

The post-mortem examination enabled us to perceive that we had reached, in fact, the thalami nervorum opticom, as we intended; but not having exactly calculated for the inclination from before backwards, at which the brain rests on the base of the cranium, the point of the scalpel had traversed the upper half of the corpora quadrigemina, and had penetrated into the substance of the left half of the protuberance; but the bundle of the infundibulum had been traversed. It will be seen that the results are the same, and that the experiment only differs in our having wounded the protuberance at the superior surface, by cutting across other parts, whilst M. Ma-

gendie wounded it at the inferior surface. The wounding separately of the thalamus nervi optici, as well as that of the corpora quadrigemina, was not followed by these symptoms.

It occurred to us, on account of the origins of the sympathetic nerve, and the direction of the bundle of the infundibulum, to make an experiment separately on the parts which we had traversed before arriving at the protuberance; we wished also to inflict the same injury on the inferior half of the arch, that is to say, on the cerebellum, as we had on the protuberance.

We began by the superior part; with this view, we raised very nearly a line of the left parietal bone, close to its posterior edge, and also close to the suture, which joins it to the occipital bone. Now the anterior extremity of this last bone is precisely on the line which separates the cerebellum from the cerebrum; we pushed through this small opening the fine blade of a pen-knife through the whole depth of the cerebellum; we took care to incline the instrument from before backwards and downwards, to avoid the corpora quadrigemina, which were not touched; then raising and withdrawing the instrument at the same time the concave edge and the point of the blade would cut the whole substance of the cerebellum, without having penetrated the fourth ventricle: the division was effected precisely on the sulcus which separates the *processus vermiformis* from the middle lobe from the whole external part of the cerebellum.

The symptoms which followed the section of the protuberance, were slightly marked. The animal preserved the standing position in a less firm manner, and almost crawling, he always preferred the injured side, and if he did not roll over, at least when he fell, it was always on that side; but his eyes preserved their natural position.

The blade of a straight and pretty large scalpel being pushed by the same foramen in a direction and at an angle perfectly the same, till the base of the cranium stopped the point, the animal carried its head so far back, that the occiput rested on the middle dorsal vertebrae. It kept this position with a tetanic rigidity; the position of the eyes, which had not been altered till now, changed; they were both drawn upwards and backwards; the inferior extremities were extended and rigid; they were deprived of voluntary motion, and even to a certain degree of sensibility, for they only moved when they were pricked, and even that only once when this kind of excitement had been used three or four times; when they were flexed, they quickly returned to extension.

The superior extremities presented a motion not before observed; it was not that of progression, for it was alternate, very quick, and not interrupted. Now, the rabbit limped rather than walked; we want words to express so uncommon a sight; it could best be compared to the alternate motions of their paws, which cats make in purring when they are

caressed, and which is vulgarly called *making a loaf*, because it resembles the kneading of the baker. This state lasted two hours, without interruption; it gradually ceased with the strength of the animal; we then opened it.

The whole floor of the fourth ventricle was entirely disorganized; which comprehends the two bundles of the infundibulum to an extent of ten lines across the *tubercle* of the *nates*. The two anterior pyramids were also affected, though not so strongly, for the point of the scalpel was passed out between them in the middle of the sulcus which separates them, about three lines lower down than the *tuber annulare*, immediately below the *corpus trapezoides*, and between the nerves of the sixth pair. These experiments were repeated many times following with the same precision, which is not difficult, when the operator is acquainted with the anatomy of the young rabbit, and when he uses the same instruments, taking care to operate on animals of the same age and size. This we effect, by procuring a whole litter.

We obtained the above mentioned symptoms four times, with this single difference, that those of the anterior limbs, that is to say, the rigidity, were transported to the inferior limbs, and *vice versa*, the extension with rigidity and insensibility being transported to the anterior limbs. Both the eyes remained, moreover, in their natural position; in the former injury of the fourth ventricle, they were simultaneously drawn upwards and backwards; there was only this difference in the injury, that, in the second case, the blade of the scalpel had traversed the medulla on a level with the *calamus scriptorius*, that is to say, a little lower down.

From the preceding facts, we may conclude,

1st. That when the fourth ventricle is wounded to a great extent,—that is to say, when a bundle of the infundibulum and half of the protuberance are wounded, we have the loss of the upright position, and the lateral rotation of the body; and, moreover, the adverse position of the two globes of the eyes.

2d. When the cerebellum only is divided throughout its whole substance, but without touching the fourth ventricle, we observe only that the symptoms decrease in the injury of the protuberance; viz. direction of the animal on the side injured, progression slow and as if crawling, uncertainty and difficulty of preserving the equilibrium, falling and half supination on that side; but moreover, natural position of the eyes.

3d. If it be disorganized immediately beneath the protuberance and the fourth ventricle, that is to say, the two bundles of the infundibulum, and a little of the two anterior pyramids (the corpora restiformia always remaining perfectly untouched,) we obtain symptoms as before described: incomplete paralysis, with rigidity and extension of the inferior limbs; curious motion of the superior extremities.

4th. Lastly, an injury, similar to the last,

performed on a level with the *calamus scriptorius*, has no influence on the motion of the eyes, although it produces symptoms of the superior and inferior extremities, but without transposition of those observed at the inferior extremities, on the superior and *vice versa*.

If we duly appreciate the facts above stated, it will be evident that we shall be justified in concluding, the medulla oblongata is not one composed of two halves only, but that each of the two halves which constitute its body, is itself composed of three columns or bundles, the properties of which are different.

The equilibrium and parallelism of the eyes depend on the state of the middle bundle, or of the infundibulum; when one of these bundles is wounded, the two globes of the eyes are drawn unequally, and in a different direction. When these two bundles are disorganized on the level of the fourth ventricle, the eyes are deranged in a uniform manner. Lastly, when the fourth ventricle is traversed at its most inferior part, or beneath the *calamus scriptorius* (it is the spot where the two bundles of the infundibulum leave this ventricle, to occupy the external lateral parts of the medulla,) then the injury only affecting the anterior pyramids, the eyes do not change their position. This last circumstance shows, that the anterior pyramids have nothing to do with the effects to which the above mentioned experiments have given rise to relative to the eyes. It is, moreover, very difficult to wound these pyramids by their anterior surface; we can only effect it by introducing an instrument curved at its extremity, into the space which separates the atlas from the occiput. Neither the posterior pyramids nor the cerebellum were concerned in the experiments. It was the bundle of the infundibulum, the injury of which produced the phenomena which we have now detailed. It is from this bundle that the sympathetic nerve principally arises. Now, according to Mr. Charles Bell, the eyes are put in the position before described by means of the obliqui, one of which receives the fourth pair.

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ON THE MEANS GENERALLY USED WITH THE INTENTION OF CURING A CURVATURE OF THE SPINE.*

When the chest and head fall forward, the most common method of trying to correct the stoop is to put on some instrument by which the shoulders and the head are held back. To operate upon the shoulders, the common back-collar is applied, and to hold back the head a riband is brought over the forehead and fastened to the collar.

While these instruments are kept on, the

* For this, and some other communications upon the same subject, we are chiefly indebted to our much lamented friend and correspondent, the late Mr. Shaw, surgeon to the Middlesex Hospital.

figure looks straight, though stiff and constrained; but the moment they are taken off, both the head and the shoulders fall more forward, than before their application. Many examples of the bad effect of artificially supporting the head might be offered. The following, although observed in the figure of a horse, is very demonstrative. When the rein, (called the bearing rein,) by which the head of a carriage-horse is reared up, with the intention of giving him a showy figure, is loosened, the head immediately falls forward, and the neck, instead of preserving the fine arch that is so much admired, droops between the shoulders. Looking to this effect, we should at first be inclined to condemn the practice followed by horse-dealers, of reining up the head of a young horse in the stable, by means of the apparatus called a dumb-jockey. But on examining into this mode of fixing the head, it will be found to operate on a different principle from the bearing-rein. Instead of a simple bit, such as the horse in harness can lean his head upon, without suffering pain, a bit, calculated to tease and fret, is put into the young horse's mouth. To relieve himself from the irritation produced by this, and which is increased by the constant pull of the elastic piece of iron to which the rein is fastened, he curls up his neck, and thus brings all the muscles of the back of the neck into strong action, instead of allowing their power to be superseded by the artificial support afforded by the bearing-rein to the horse in harness.*

Many different contrivances, but all acting nearly on the same principle as the *bearing-rein*, have been proposed as means for obliging a girl to keep her head erect.

There is one mode, which, to a person ignorant of anatomy, seems to be particularly well adapted for this purpose; but it is, in fact, more objectionable than the plan of tying the head back with a riband. A piece of lead, of some pounds weight, is slung over the back in such a way that it must be supported by a riband put around the head.

Although this contrivance prevents the head for a time from falling forwards, its bad effects may be demonstrated. When the weight is on, the muscles of the back of the spine are passive, while those on the fore-part of the neck are necessarily brought into action to prevent the head from being pulled too far back: this is easily proved; for if we put the fingers on the sternal portions of the sternocleido muscle, which, with the small muscles on the fore-part of the throat, pull the head forwards, we shall feel them tense and in ac-

tion. The increased activity of the muscles on the fore-part, and the passive condition of those of the back, may be further exemplified by raising the weight when the girl is not aware of our doing so; the head will then be immediately poked forwards.

We have many opportunities of observing the incorrectness of the principle on which all similar plans for the cure of a stoop have been founded. For instance, porters who carry burdens on the back, by the assistance of a band round the forehead, always stoop; while those who carry baskets before them suspended by a band round the back of the neck, are peculiarly erect. But the most remarkable example of the effect of the head being pulled back by a weight hung behind, is the condition of the women who carry salt in the streets of Edinburgh, for they may be recognised as much by their miserable Sardonic grin, which is caused by the constant excitement of the platysma myoides muscle, as by their stoop.

Very annoying and even distressing consequences may ensue from any system of treatment where a constant resistance to the muscles of the fore-part of the neck is kept up. A gentleman had for many years worn one of the collars invented by Mr. Chesher; after some time, the muscles of the back became so weak, as to be incapable of supporting the column, while those on the fore-part of the neck were so disproportionately increased in strength, by the constant resistance opposed to them by the strap passing from the suspending rod under the chin, that whenever the strap was loosened, the chin was forcibly drawn towards the chest. As the muscles of the back-part of the neck did not offer any counteracting resistance, the windpipe was now pressed down, or almost doubled on itself. As soon as this took place (and it was almost immediate on the attempt to sit up without the collar,) the patient was seized with such a sense of suffocation, as to be obliged to throw himself on his back. As he was able to breathe with ease as he lay on his back, his advisers were led to believe that it was the weight of the head which pressed down the windpipe. To counteract this pressure, various contrivances had been proposed to support the head. Indeed, the patient himself was so convinced, from what he had heard, that it was the weight of the head which pressed down the windpipe, and so alarmed had he become from the certainty of having a fit of suffocation when the head was left unsupported, that there was much difficulty in persuading him to believe that if the head could be made *heavier*, the sense of suffocation would be relieved. He was at length induced, although with great dread of the consequence, to allow about fourteen pounds of shot to be placed on the top of his head. He was very much alarmed, but it was highly gratifying to witness his surprise and pleasure in finding that, instead of his head being weighed down, he could support it, and could breath with ease while in the upright posture.

* When the Russians wish to give a horse high action in trotting, they accustom him, while young, to wear heavy shoes on the fore-feet. The resistance to be overcome necessarily increases the strength of certain muscles; and hence, when shoes of the common size are put on, the horse lifts his feet higher than one which has not been subjected to this discipline.

The following is the principle on which this plan was proposed:—the muscles of the back-part of the neck had been brought into such a state, that their ordinary stimulus was not sufficient to excite them to the action necessary to counteract the efforts of those on the fore-part of the neck, which had been evidently increased in strength. The placing a weight on a certain spot on the head formed an additional stimulus to the muscles of the back-part of the neck; a fact which the reader may prove by an experiment on himself.

By proceeding on this principle, by combining a variety of exercises, and by gradually diminishing the weight carried on the head, this gentleman was soon able to walk and sit in a state of great comfort, without being obliged to use any artificial support.

It is well known, that the neck-collars support almost the whole weight of the head and shoulders by the strap which passes under the chin. It must also have been observed, that the wearer very frequently pushes down the head against the chin-strap. In this way, the muscles on the fore-part necessarily become stronger, while those of the back, being deprived of their natural stimulus to action, in consequence of the rod superseding their office, become diminished in power. Even were there no change in the degree of strength in the muscles on the fore-part, the head would naturally fall, if the support afforded by the chin-strap were removed; but as these muscles are increased in power, while those of the back are diminished, the head must not only fall, but even be pulled down.

However, although the collars and the lead weight, as they are generally used, are not only inefficacious, but even hurtful, they may occasionally be useful in keeping the head in a certain position, after it has been brought to it by such exercises as tend to strengthen those muscles of the back which support the shoulders and head. But the opinions commonly entertained, as to the means of counteracting an habitual stoop, are so erroneous, that even the position of a tailor sitting on his shop-board is better than the plans generally recommended. This at first appears ridiculous; but the manner a tailor holds his body when he walks, proves that there is something in his habits which tends to the correction of a stoop; for he is quite a caricature of a strutting erect figure, especially in the way he bends in his loins and carries his head.

The peculiarity of the tailor's gait proceeds, in a certain degree, from the bent position in which he sits: but this explanation is not at first satisfactory, since it may be observed that other tradesmen, who also stoop while at work, generally have their head inclined forwards, and have also a distinct and habitual bend in the neck; such, especially, is the condition of persons who sit at a table and stoop forwards, as watchmakers, engravers, &c. It is not difficult to explain the cause of the difference, and the inquiry will assist in directing us to the principles which we ought to recollect in our operations upon the spine.

In the sitting position of the tailor, the head hangs so low, and so complete an arch is formed between it and the pelvis, that the muscles of the spine are called into strong action to support the head; the necessary consequence of this is, that these muscles become even unnaturally strong, or at least so strong as to predominate over those by which the spine is pulled forward. But the bent position is not the only cause of increase in the strength of the muscles, for it depends also on the exercise given by frequently jerking the head backwards. In those who stoop from the middle of the body, as in writing or working at a table, the muscles of the spine are not called into action; for, while the head is in this position, it rests or is supported by the ligament of the neck. The ligament, being thus kept constantly on the stretch, becomes lengthened, instead of being made more contractile, as muscles would be; and hence the stoop is increased. When this is combined with the consequences of the want of muscular action, the deeper ligaments, which bind the upper vertebræ, gradually yield; if the operation of these causes continues for a certain time, the bones and cartilages themselves become altered in shape, and consequently an almost irremediable stoop is produced.*

This view derives confirmation, from what may be observed in the shape of the tailors in some parts of Germany, who, instead of having the erect figures of London tailors, are quite bent. On inquiring into the cause, we find that, instead of sitting as tailors do in this country, a hole is cut in the table, and a seat is placed within it; so that their position, while working, becomes nearly the same as that of persons who stoop while sitting at a table.

It may, perhaps, be objected, that labourers, and especially the vine-dressers in France, are remarkable for the complete arch which their body forms, although they bend while at work as much as the tailor does. This may also be explained; for in the labourer the bend is produced by the pelvis rolling on the head of the thigh bones, while in a person sitting as a tailor the pelvis continues nearly fixed, and the bend is in the vertebræ on the pelvis.

The erect figure of the Turk perhaps comes from the manner of sitting which is common among Eastern nations; but the heavy turban, and the spice box slung from the back of the neck, may account in a great measure for the fine figures of the Turkish Jews who frequent the streets of London.

We may even take the shoemaker as an example of the effect of a particular manner of sitting, and of frequently using the muscles of the shoulders. He is also a little in caricature,

* Elderly persons may recollect how often the girls who worked at *tambouring* were crooked: the present fashionable amusement of embroidering seems to have, in some instances, the same effect.

but he carries himself better than the tailor, and the cause is obvious. The tailor's figure is very erect, but the right shoulder is generally a little higher or larger than the left, from the constant exercise given to the right arm, while the left rests upon the knee: this inequality of the shoulders is not observed in the shoemaker, because he not only uses both arms equally, but the muscles by which the scapulæ are supported, become so strong by the habit of jerking back his elbows while he works, that his shoulders always appear more braced back than those of any other class of persons: indeed, so characteristic are the figures of tailors and shoemakers, that they may be easily distinguished in a crowd.

These circumstances are mentioned, as they afford familiar examples of the principles on which we ought to proceed, in endeavouring to correct deformities; but it would be ridiculous to propose the position either of the tailor or of the shoemaker, as the best adapted to correct a stoop or falling forward of the shoulders.

The preceding observations apply also to the contrivances usually employed to keep the shoulders back, and particularly to the question of the propriety of using the common back-collar.

The part of the back formed by the ribs is not a flat, but rather a round surface; and as the shoulder-blades rest on this, they would fall forwards were they not prevented by the collar-bones; but as these bones are united to the breast-bone by a moveable joint, and as the weight of the arms operates principally on the interior angles of the scapulæ, both the collar-bones and the shoulders would fall forwards, were it not for the action of several strong muscles which pass from the spine to the scapulæ. But these muscles may be destroyed by any contrivance which supersedes their use; they waste, and become nearly useless, while those on the fore-part of the chest, being excited to resist the straps, will become increased in power; and hence, when the collar is taken off, not only will the shoulders fall forward as in a delicate person, but the muscles on the fore-part of the chest will predominate over those by which the scapulæ should be held back, and *pull* the shoulders forwards.

The spine and the ribs are occasionally bent so as to have some resemblance to the back of a spoon. In such cases, the shoulders not only appear high and round, but the lower angles of the scapulæ project in an extraordinary manner, because the upper and anterior angle is not only unsupported by the ribs, but is dragged forwards by the clavicles which are carried in the same direction with the sternum. When this is to a considerable extent, it constitutes the *contracted chest* or the *chicken breast*. This, in a slight degree, is common in London, and especially among young lads; it may be discovered by the coat having the appearance of being worn more opposite the lower angle of the scapula than at any other part.

Such a condition of the chest can only be completely remedied by appropriate exercises; but a collar is here necessary for a time, to keep the bones in the improved condition into which they are brought by the exercises.

These arguments will probably appear sufficiently well founded to prove that a girl, under ordinary circumstances, cannot hold her head or shoulders back, unless the muscles by which they are naturally supported are in a proper condition. Various contrivances have been proposed to strengthen these muscles. Dumb bells, if managed in a particular manner, are good; skipping, when the arms are thrown backwards and over the head, is still better; the exercises, called Spanish exercises, performed with two long poles, are also useful; but to each of these there may be objections, as they all operate more or less on the spine or ribs, which, in case of a bad stoop, are generally affected.

The following anecdote will, perhaps, set the question of the propriety of wearing the back collar in a correct point of view. A surgeon was consulted by a gentleman, who is now one of our first tragedians, as to the best mode of correcting a stoop which he had acquired. The surgeon told him that neither stays nor straps would do him any essential good, and that the only method of succeeding, was to recollect to keep his shoulders braced back by a voluntary effort. But the tragedian replied, that this he could not do, as his mind was otherwise occupied. The surgeon then told him that he could give him no further assistance. Shortly after this conversation, the actor ordered his tailor to make a coat of the finest kerseymere, so as to fit him very tightly, when his shoulders were thrown back. Whenever his shoulders fell forward he was reminded by a pinch under the arms, that his coat cost him six guineas, and that it was made of very fragile materials; being thus forced, for the sake of his fine coat, to keep his shoulders back, he soon cured himself of the stoop. The surgeon was much obliged to him for the hint, and afterwards, when consulted whether young ladies should wear shoulder straps, permitted them, on condition that they were made of fine muslin, or valuable silk, for tearing which there should be a forfeit.

An inquiry into the manner a girl should sit, may appear trifling to those who have not been in the habit of seeing many cases of distortion of the spine, but it is intimately connected with the present subject, and is really of considerable importance. The question has been disputed; one party insisting that girls should always sit erect, while others are advocates for a lounging position. It is not difficult to show that both are wrong;—when a delicately formed girl is supposed to be sitting erect, she is generally sitting crooked: to a superficial observer she may appear quite straight; but any one who will sit on a music stool, and endeavour to keep his body in a perpendicular line for ten minutes, will be convinced that it is difficult for even a strong

man, to sit as long as a delicate girl is expected to do, without allowing the spine to sink to one side or to fall forwards.

The attempt to sit erect beyond a certain time is injurious, for although bending the spine occasionally, is useful rather than hurtful, yet when it is done involuntarily, and when the bend is attempted to be concealed by an endeavour to keep the head straight, there is danger of the spine becoming twisted. Indeed, a double curve is generally the consequence; there is first a bend to one side, to give ease to the fatigued muscles; and then, to conceal this, there is a second curve that is necessarily accompanied by a slight twist in the vertical line of the whole column.

The proposal to allow children to sit in a crooked or lounging position, seems to have been founded on the idea that all the muscles are more relaxed in this way, than even when the child lies at full length on its back. This notion is certainly incorrect, and such a mode of sitting is injurious; for even were the muscles more relaxed by it, the bones and ligaments acquire such a shape as necessarily produce distortion.

It may naturally be asked how a girl should sit, since it would appear, that whether she is in an erect or stooping posture, she is equally in danger of becoming crooked. As sitting, in the manner generally recommended, affords little or no support to one who is weak, the safest answer would be, that a delicate girl should not sit for even more than five or ten minutes, without having some support to her back, and when she is fatigued, that she should lie down or recline on a couch. But as it would be very annoying to a girl, not to be allowed to sit up except for so short a time, and as a couch is not always at hand, we must endeavour to show how a delicate girl may remain in an upright posture for a reasonable time, without incurring any risk of becoming crooked. This leads to an inquiry into the merits of the chairs, which are at present generally used by children.

Young ladies are often obliged, while at their music lessons, to sit upon those chairs, which have high backs, long legs, and small seats. These chairs are said to have been invented by a very eminent surgeon, and are intended, either to prevent distortion by some supposed operation on the spine, or as the most effectual means of supporting the body. It is difficult to imagine, how a chair of this description can effect the first purpose; and to discover how far it is calculated for the second, the reader should make the experiment on a chair of the same proportion to his figure, as the chair in question is to that of a little girl. He will find that if the seat or surface on which he rests is small in proportion to his body, the chest will, after a time, either fall forward or to one side, unless he exert himself to a degree that is very fatiguing. Indeed, if the seat be at the same time so high, that the feet do not rest fairly on the ground, but dangle under the chair, a forward position of

the head is almost necessary to preserve the balance of the figure.*

The objections to such chairs have been met with the assertion, that girls feel remarkably comfortable in them. This is no argument in favour of their use, for it is not uncommon for a girl, who has seven or eight pounds of iron strapped upon her body, and next to her skin, to say the machine annoys her so little, that she does not care how long she wears it.

But whether this chair is agreeable or not, it is easy to show that it is not calculated to give much proper support to the body, and that it is almost impossible, for a delicate girl to sit long in a natural or easy position upon it.

It may be allowed, that the chair which we consider the most comfortable, that is, the chair which affords the most support to the body, should, if made in proper proportions, be the best for a delicate girl. In such a chair, the *seat* should be scarcely higher than the knees, (thus permitting the whole of the foot to rest on the floor,) and of such a size, that on sitting back, the upper part of the calves nearly touch it. This form of *seat* is very different from that of the chair alluded to, the *back* of which is also equally objectionable, for, instead of being in some degree shaped to the natural curves of the spine, it is made nearly straight, and projects so as to push the head forwards. A delicate girl should always sit so as to rest against the back of the chair, and, if the lower part of her spine is weak, a small cushion will afford great relief. As it is quite a mistake to suppose that the shoulders, if raised in any other way than by the action of the muscles, or by the curvature of the spine and ribs, will continue high, there is no real objection to a girl who is delicate being supported by an arm-chair; for, by occasionally resting on the elbows, a considerable weight is taken off from that part of the spine which is the most likely to yield.

These observations refer only to the manner in which delicate girls, whose spines are still straight, should sit: when the spine is actually distorted, it will be necessary to use other means.

From the Medico-Chirurgical Review.

NEW METHOD OF TREATING SYPHILIS. By Dr. C. H. DZONDI, Professor in the University of Halle.

Professor Dzondi, from an experience of ten years, comes to the conclusion that the best method of treating syphilis, is not by small doses of mercury gradually introduced into the system, but by large doses quickly administered. The fundamental principles of this new method are these:—1mo. That mercury is a dangerous poison, the effects of which are

* It must be almost unnecessary to remind the reader, that if the knees are bent in standing or walking, there is a curve in the spine at the same time.

much more difficult of cure than the most inveterate syphilis. 2^{do}. That mercury is indispensable in the cure of the disease, in all cold countries; and is only poisonous when exhibited in a certain manner. 3^{io}. That the present mode of administering the remedy is, in general, inadequate to the complete eradication of the disease, except in cases where the virus is mild. In cases where it is otherwise, it either aggravates the malady, palliates the outward symptoms, or masks the disease from view. 4^{to}. That the oxymuriate of mercury, properly prepared, is the best form of the remedy. Professor D. begins with about half a grain of the sublimate for a dose. (per diem,) and increases it to two or three grains daily. He is convinced that a large quantity may be taken in small doses, without ultimate cure; while a small quantity given in large doses will be speedily effectual. He gives the medicine immediately after taking food, and never on an empty stomach; sometimes combining opium with it, when pain is complained of in the stomach or bowels. He does not consider it necessary to make any change in the *kind* of food which the patient takes during the course. Salivation rarely takes place under this mode of treatment. The duration of the course is generally four weeks, during which, the action of the skin is to be promoted by warm air, warm clothing, and confinement to the bed-room in cold weather. In summer, and in very fine weather, the patient may be permitted to go out for an hour or two in the middle of the day. In order to quicken the action of the absorbents, and thus to diffuse the remedy as rapidly and as extensively through the system as possible, the patient is to take no more food than is absolutely necessary for the support of life. He does not particularly object to alcoholic, or other stimulating drink, in moderation. Sarsaparilla he considers the best auxiliary to the mercury; but by no means adequate to the cure of the disease by itself, especially in northern climes.

The above practice appears to be a modification of that which has been tried and recommended by some surgeons in this country—we mean Mr. John Cunningham and Mr. James Boyle, surgeons in the Royal Navy. They gave calomel in 20 grain doses twice or thrice a day, so as rapidly to affect the system, when the syphilitic symptoms were found quickly to give way. We leave it to our surgical brethren to think on these proposals, based as they are on experience. The high character of Professor Dzondi guarantees the authenticity and veracity of any thing proceeding from his pen.

From the London Medical Repository and Review.

REPORT OF SOME OF THE MORE IMPORTANT MEDICAL CASES TREATED AT THE KENT AND CANTERBURY HOSPITAL. By H. W. CARTER, M. D. F. R. S. E. Fellow of the Royal College of Physicians, London.

1. CASE OF MALFORMATION OF THE HEART.

Richard Patmore, æt. 24, by trade a brick-

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layer, was admitted January 27th, 1826, labouring under the following symptoms:—Palpitation; shortness of breath; much distress in ascending a flight of steps, or climbing a hill, or indeed upon any exertion more than usual. Troublesome cough, with copious expectoration; countenance of a purplish hue; lips very dark; expression anxious; pulse regular—about ninety; tongue furred; urine scanty; bowels tolerably regular; disposition to anasarca of lower extremities. Complaints had been coming on for some time, and he had been under medical treatment; but had not entirely relinquished work till within a few days of his coming to the hospital. He was bled to the amount of ten ounces; an issue was made in the left arm; and the following draught was directed thrice a day: *R.* Infusi Digital. \mathfrak{z} ss. Mist. Camphor. \mathfrak{z} j. Olei Anisi, gutt. ij. M. fiat haustus.

February 2^d. The cough and expectoration were diminished; pulse considerably affected by the digitalis, which was therefore discontinued. The patient afterwards had leeches to the chest, and took demulcent and other medicines, which I forbear dwelling upon, since they appeared to be of little or no service. He however improved by rest and quiet, and was discharged March 6th. On the 17th of the following November he again presented himself at the hospital. The symptoms already enumerated had become more urgent, excepting that the cough was now unaccompanied by expectoration. There was distressing sensation of faintness at intervals; fluttering of the heart, and at the epigastric region; inability to bear the recumbent posture; sleep disturbed by frightful dreams. Examined with the stethoscope: the action of the heart was very perceptible over the whole of the chest; impulse considerable, sound very loud, so much so, that in several attempts I could not ascertain the state of the respiration.

Blue pill, with Squill, and extract of Cornium, night and morning. Inf. Digital. \mathfrak{z} ij. Mist. Camphor. \mathfrak{z} vij. Sp. Æther. Nitr. \mathfrak{z} jss. Tinc. Card. C. \mathfrak{z} j. twice a day; a blister to the chest; laxative draught occasionally.

The effect of these medicines was to increase very considerably the quantity of urine; to remove the anasarca of the lower extremities; and to render the patient altogether more comfortable. The pills were discontinued on the 24th, as his mouth was getting sore, and the oppression of the chest being greater, with some pain, eight leeches were applied.

27th. Distressing fluttering about the heart, and oppression of breath have come on for the last two nights as he has been getting into bed, and have continued till four o'clock in the morning.

Mixture continued during the day; Camphor mixture with Sp. Æther. Nitr. \mathfrak{z} j. Tinc. Hyoscy. \mathfrak{z} j. Syr. Papav. \mathfrak{z} j. at night.

From this last date, to December 3^d, there was little alteration in the symptoms; on that day the patient was again bled to ten ounces, as he complained of increased oppression, and his countenance was much loaded. The mix-

ture, with inf. digital., having occasioned nausea and vertigo, it was, on the 13th, discontinued; afterwards diuretics variously combined, and occasional antispasmodics were given; and, lastly, he took a dessert spoonful of white mustard seed twice a day, and five grains of blue pill, with eight of dried subcarbonate of soda, and four of extract of hyoscyamus at night. It may be thought extraordinary that I should, in this case, have prescribed the mustard seed. I did so because the patient at that time complained chiefly of a sensation of cold at the stomach, and of indigestion. That organic disease of the heart existed was evident enough; but the distressing symptoms of that disease were now absent, and the patient's chief annoyance was dyspepsia. I thought this annoyance might be mitigated by the remedy in question, and it certainly was mitigated. On the 30th January the man was, as nearly as possible, in the same state as when he first became my patient, a year before. That he would one day die suddenly I was convinced, but the fatal event might be distant. It was therefore necessary to discharge him from the hospital, and he quitted us with an injunction not to return to his employment, as he seemed disposed to do, and to be careful as to his diet, and the state of his bowels.

Whether he attended to the directions which were given him, I am unable to say; but early in March I received from Mr. Sankey, of Dover, who had attended the poor man before he came to Canterbury, the following statement:—

"I was not aware," says Mr. Sankey, "of his (Patmore's) return home till thirty-six hours before his death, when he requested me to call. I found him, as I had frequently seen him before, labouring under most distressing dyspnoea, livid lips and nose; coldness of the surface; pulse scarcely to be felt; very irregular action of the heart; he was also slightly delirious. The time of my visit was in the evening. On the following day he sent word that he had passed a bad night, but felt better; on the following night he told his wife to go to sleep, as he hoped soon to do himself. She awoke in a few hours, and found him dead by her side.

Examination after Death. The head was not examined.

Thorax. Right lung universally adhering to the pleura costalis, but free from disease. Left lung gorged with blood; the inferior lobe larger than natural; air cells distended and enlarged, and one or two air vesicles attached to the edge of the inferior lobe.

Heart enlarged, particularly the right auricle, which, together with the right ventricle, was distended with blood, and contained several large false polypi. In the septum ventriculorum a small aperture was discovered at its upper part, which just admitted the end of the smallest bougie, but was not large enough to admit the bulb of a silver probe. Just over the aperture was a little valvular formation, apparently an attempt of nature to remedy

the defect. The valves were all in a natural state.

The abdominal viscera were all healthy. The liver rather larger than ordinary.

2. CASES OF ENURESIS.

1. Stephen Huckstep, æt. 16, labourer, was made out-patient, December 30th, 1825. He had from childhood been subject to incontinence of urine in the night time. He had seldom retained his water for above two or three nights in succession, and, for the last three months, not one night had passed without his wetting his bed. He was a pale weakly looking subject. A blister was applied to the perineum, and fifteen drops of tincture of cantharides, with a scruple of compound tragacanth powder were given thrice a day in camphor mixture, for a week, but without any beneficial result. The dose of the tincture was then increased to twenty drops, half a scruple of Dover's powder was given at bed time, laxative pills as occasion might demand, and a blister was applied to the pubic region. At the end of the second week there was no improvement: I now determined to make trial of tincture of iodine, as a tonic, and the patient was directed to take six drops in a little water three times a day, and a laxative draught twice a week. On the 20th, viz. a week from his commencing the tincture, he was rather better. The dose of the medicine was increased to ten drops, and a second blister was applied over the pubis.

February 3d. Enuresis had occurred but twice in the preceding fortnight; and, he said, he never remembered having been so long free from his troublesome complaint. His general appearance was wonderfully improved. Pergat.

February 23d. No recurrence of the disease; health greatly improved; countenance florid; strength increased; he considered himself quite well, and was, accordingly, discharged.

2. Encouraged by the event of the preceding case, I adopted a similar plan of treatment in that of a lad, by name John Wraight, who had once before been under my care, as an in-patient, for affection of the kidneys and bladder, attributed to a blow. He got considerably better, but soon relapsed. February 18th, 1826, he was again admitted as out-patient. He complained of a good deal of pain over the region of the bladder, and of the back; he was unable to retain his urine by night or by day; the bowels were in an irregular state, not acting satisfactorily, but their contents passing in small quantities, and very frequently, and without the patient's being able to control their evacuation. The lad's general health was much impaired; he was pale, feeble, emaciated. Clysters of cold water, which had formerly been of decided benefit, were resumed, and, after the application of a few leeches to the hypogastric region, he took five drops of tincture of iodine in distilled water, with a little simple sirup, thrice a day; castor

oil, and the compound rhubarb pill were given occasionally.

23d. A large quantity of red sand had been passed during the week. The pain over the bladder was relieved; the dribbling of urine much less; pulse natural; tongue clean; bowels regular. Perstet et appl. abdomini emplast. riborans.

March 3d. Incontinence of urine has ceased. Sumat. Tinct. Iodin. gutt. viij. bis die.

24th. Urine passed in sufficient quantity, and in a full stream, about three times in the day; no sand comes away, nor is the urine high coloured; no fulness or tenderness whatever over the region of the bladder; bowels rather costive. General health materially improved. Sumatur Tinct. semel die.

April 14th. Discharged cured.

This lad afterwards went into service, and when I last heard of him, i. e. October 11th, 1827, was free from complaint.

3. CASE OF DIABETES, WITH DISEASE OF THE LUNGS AND OF THE LIVER.

Daniel Parker, at. 36, mariner, was admitted in-patient, February 24th, 1826. There was considerable enlargement of the liver, and induration, especially of the left lobe; cough, with expectoration, and dyspnœa, much increased upon exertion. He had, from the nature of his employment, been in the habit of drinking spirits, though not to excess. The affection of the liver being the chief complaint noticed by the patient, as well as by the medical man who had previously attended him, my attention was mainly directed to it. Mercurial ointment was rubbed in, blue pill taken every night, and inf. gent. c. with sodæ carbon. thrice a day. The cough left him, and respiration became more easy in a few days, and, upon the mouth becoming sore, the liver disease seemed to be much relieved. On the 11th March, however, I learned that the man had, for above a twelvemonth, been in the habit of passing a much greater quantity of urine than was natural. He was now desired to measure the quantity voided in the twenty-four hours, and, from the eleventh to the fourteenth, it amounted to ten pints daily, while the liquid ingesta were only six, or at the utmost eight pints. The urine was pale, very perceptibly sweet, frothy on the surface after it had stood a long time. The patient being questioned more minutely than before, stated that he had pain about the region of the kidneys, that his thirst was great, appetite craving—that he was troubled with heartburn, had entirely lost the venereal appetite, was much disturbed at night, owing to the frequent calls to pass his urine. There was no excoriation of the prepuce, nor did the gums appear affected. The pulse was at this time frequent, and rather small; tongue clean; bowels inclined to be costive. Sumat. Tinct. Iodin. gutt. vj. ter die, et Sodæ Phosphat, ζ ss. bis vel ter in hebdomada; omittantur medicamenta prius præscripta.

March 21st. Urine less by nearly two pints in the twenty-four hours; thirst diminished;

tongue clean; pulse moderate as to strength and frequency; two motions daily; sensations much improved. Thinks he gains strength. Sumat. Tinct. Iodin. gutt. jx. ter die. Full diet. 23d. Urine reduced to six pints, but it is still sweet. 25th. Urine as before. Nearly two thirds of the whole quantity passed during the night. From long habit he wakes very often, and then always experiences a desire to make water, though, frequently, little passes. Tongue moist, but rather white, with the edges florid; pulse firm and satisfactory; bowels open; urine of more natural colour and odour, and less frothy. The man's spirits are excellent—he says he has not felt so well for four years. Tincture continued. Ten grains of Dover's powder at bed time. N. B. The powder was taken only once, as he did not rest the better for it. 28th. Urine five and a half pints, of a natural colour, but still somewhat saccharine. Liquid injeſta, three pints. April 4th. Urine and liquid injeſta exactly balanced. *Urine perfectly natural as to appearance and taste.*

Upon my visit on the 6th, I learned that, on the preceding day the patient had been all at once attacked by sore throat, which he attributed to his having lain in bed exposed to a stream of cold air. Iodine discontinued; a gargle, and six leeches to the throat. Directed also to inhale the steam of warm water. On the following day he swallowed with more ease, but complained of diffused soreness over the chest. There was tremour—the pulse was feeble; tongue foul; bowels constipated; urine passed only once in the last twenty-four hours. Laxatives—demulcent mixture, with myrrh and tinct. opii. On the 8th, he was much worse. There was profuse purulent expectoration. Stomach retained no liquids. He died at about ten o'clock at night.

In the termination of this case I was greatly disappointed, and, at the moment, experienced much uneasiness, for I feared that the iodine tincture had done mischief. Yet it had been given only for a short time, and in very moderate doses, and its effects had been most anxiously watched. Every thing seemed to be going on well up to the beginning of April. The diabetes was decidedly checked, and the general health and appearance of the patient were improving day by day. Far from losing in bulk, he was perceptibly gaining. He was himself most sanguine in his hopes of recovery, and I certainly did indulge a hope that he would leave us in a better state of health than he had known for several years before. No one untoward symptom occurred till April 4th, and the sore throat seemed to be accounted for plainly enough by the patient himself. Upon reviewing the history of this case, I am disposed to conclude that the medicine had no share in bringing about the fatal event, but that exposure to cold again called into action the disease of the chest, which had subsisted some time before. I very much regret that an opportunity was not given us of examining the body, but I was unable to prevent its removal. Should a case of diabetes again come

under my notice, I shall once more cautiously make trial of the same remedy.

4. CASE OF HYDROCEPHALUS, WITH DISEASE OF THE KIDNEYS AND BLADDER.

William Page, ætatis 21, was admitted, April 20th, 1827, with cough, and all the symptoms, as it then seemed, of confirmed consumption. These were indeed so marked, that I at first hesitated as to the expediency of admitting the patient.* It was stated, however, that the affection of the chest was of recent date, occasioned by cold, and contracted by working in the tunnel of the Canterbury and Whitstable railway. There was *no other complaint* mentioned, excepting an eruption on the scalp, which had subsisted from childhood. The head was shaved and well washed, and for the present, as the lad appeared very feeble and exhausted, a cordial anodyne was given at bed time. On the next visit, the symptoms continued the same. No pain of the chest, but cough and muco-purulent expectoration. A demulcent saline mixture with tinct. digital. was ordered by day, and an opiate at night. By the 30th, the cough and expectoration were nearly gone; the pulse was rapid and feeble; dyspnœa; tongue clean; bowels regular; appetite good; slept very well. This lad had a cranium most unhappily formed, almost the cranium of an idiot. He was very dull, and all the reply I could elicit from my inquiries was, that he was better. Medicines continued. A little of the ungt. hydrarg. nitrat. diluted with ungt. cetacei for the eruption. Tartar emetic ointment to the chest. In two or three days more he took to his bed. Answered questions rationally, but in the most laconic style. No acknowledgment of the *slightest* pain of the head, or chest, or abdomen, or any part of the body. Appetite continued very good. Pulse extremely low. Tongue becoming brown. The former medicines were discontinued, and cordials given; but in spite of every effort to rouse him, he got gradually worse and worse, till, for the last four days of his life, the symptoms of pressure on the brain were unequivocal. He was now quite insensible. A blister was applied to the nucha, and tartar emetic ointment to the head. At last he became comatose, passed his urine and faces unconsciously, and died, May 14th.

The body was examined about eighteen hours after death. Considerable effusion was found in the ventricles, and in the substance of the brain. There was also deposition of ossific matter on the dura mater.

In the chest there were adhesions of the lungs on both sides, to the pleura costalis. Considerable effusion in the pericardium. Heart free from disease. Nothing remarkable was found in the abdomen till we came to the

kidneys. The left kidney was much diminished in size, and contained a quantity of sabulous matter, as did also the right kidney, but it was free from disease. The coats of the bladder were much thickened, and it was almost completely filled with pus and two large calculi.*

At the period of Page's admission, not the slightest hint was given me, either by himself or his mother, of his ever having laboured under symptoms of stone, nor was one symptom observed during the time he was my patient. After his death, however, it was discovered that he had formerly complained of pain in the region of the bladder, and dyspnœa, &c. at intervals.

From the Edinburgh Medical and Surgical Journal.

LECTURES ON THE OPERATIVE SURGERY OF THE EYE; or an *Historical and Critical Inquiry into the Methods recommended for the Cure of Cataract, for the Formation of an Artificial Pupil, &c. &c.* By G. J. GUTHRIE, Esq. 2d edition, with Seven Explanatory Plates. London, 1827. 8vo. pp. 554.

In the cultivation of ophthalmic surgery the surgeons of this country have been rather behind their foreign brethren. The diseases incident to the eye, and the means necessary for their cure, had been assiduously investigated by the French and German authors long before they had attracted much attention in England. With the exception indeed of the obscure treatises of Coward, Read, Crosse, and others equally unknown, the desultory writings of Taylor, and the obsolete book of Chandler, the English literature of surgery possesses no work professedly on the diseases of the eye; and only in the writings of Cheselden, Sharp, Warner, Pott, and Wathen, do we find some incidental observations on the merits of certain modes of treating cataract, and some of the more ordinary complaints of the organ of vision.

The first of the British surgeons who made the diseases of the eye a particular study were Ware and Cunningham Saunders; and even the writings which these ingenious men have left can by no means be compared with those, especially of the German surgeons. To omit the labours of De Berger, Heister, and Richter, which belong to an earlier era, the literature of Germany boasts of the elaborate writings of Schmidt, Beer, the two Wenzels, Soemmering, Himly, and more recently those of Benedict, Walther, Weller, and Langenbeck; while that of Italy may justly be proud of the classical production of the Professor of Pavia.

On the career of these distinguished models, however, our countrymen have lately made rapid and effectual advances. The writings of

* The stethoscope would have dispelled my doubts, but I regret to say that I have, until very lately, neglected the use of it, as well as of percussion.

* They were broken in extracting them from the bladder, but the fragments weighed fourteen drachms.

Wardrop, Lawrence, Vetch, and Travers, have contributed in a remarkable degree to illustrate the nature of many of the diseases incident to the organ of vision, and have principally tended to introduce a more regular and systematic method of cure than had been in previous use. The example of these experienced surgeons, combined with the establishment of a variety of charitable institutions for the express purpose of affording relief to those of the lower ranks labouring under different forms of impaired vision, has procured for the study of ophthalmic surgery a degree of attention and interest from which, doubtless, the art of the oculist must be justly expected to derive the greatest improvement.

In this department, however, the most zealous labourer is undoubtedly Mr. Guthrie; and to him the English student is under the greatest obligations for the diligence with which he has exerted himself to render the art of the oculist a branch of surgery at once scientific and accessible. The present work of this author is devoted chiefly to the operative branch of ophthalmic surgery; and on this department is it doubtless the most comprehensive treatise at present extant. Though enjoying excellent opportunities of acquiring practical information on the diseases of the eye requiring the interposition of the surgeon, Mr. Guthrie has not confined himself to the results of mere personal experience. He has evidently bestowed great pains in studying the works of the foreign ophthalmological writers, and he has exercised in general a just and liberal spirit of remark on the merits of their respective methods of treatment.

The diseases of the organ of vision requiring the aid of surgical operation consist, as in other parts of the body, of certain changes in structure, which are very often the effect of inflammation, or some similar disorganizing process. When they are the consequences of the former agent, they may often be prevented, or at least rendered less injurious in their effects by the prompt and timely interposition of general medical and surgical treatment. When they have exceeded this point, and such a result may often take place, they are no longer amenable to the same influence; and nothing short of an operation particularly adapted to the purpose is adequate to restore to the organ its former utility. In other circumstances organic changes may take place slowly and insensibly, yet with great certainty, and either impair the utility of the organ, or destroy it entirely. In this case also the surgeon has no resource, save a judicious and dexterous application of the principles of his art.

Entropion, or inversion of the eyelids, whether occurring in the upper or in the lower eyelid, depends, according to Mr. Guthrie, on the conjunct operation of several causes. An opinion has very generally prevailed, that this painful and obstinate complaint depends on the mere inversion of the hairs of the eyelashes. Mr. Guthrie shows clearly, that, though this inversion is part, it does not constitute

the whole of the disorder; and the derangement of the eyelashes, termed *trichiasis*, is itself a consequence of disease,—generally chronic inflammation of the eyelid and tarsus. Inversion of one or more *cilia* may result from various causes, and produce a partial inversion of the eyelid; but complete general inversion or entropion is a consequence of chronic inflammation, operating at once on the tarsal cartilage, and on the excessive action thereby induced in the *orbicularis* muscle.

He adopts that part of the hypothesis of Mr. Crampton which ascribes this vicious direction of the eyelids to the contractions of their angles; but objects to the competency of that which supposes the disease to depend on the shrivelling and thickening of the tarsal conjunctiva, for two reasons. 1st, In the most severe cases of granulated or fungous conjunctiva, instead of inversion, there is a tendency to eversion; and 2dly, as the tarsal conjunctiva is firmly attached to it, the action of the levator palpebræ must be on the whole, and not on the edge, as the hypothesis of Mr. Crampton requires.

In short, general inversion of the edge of the tarsus of the upper eyelid Mr. Guthrie represents to be first determined by the swelling of the external parts in inflammation, acute or chronic, and the spasmodic and extreme contraction of the *orbicularis*, and to be completed by contraction of the angles of the lids, and the inversion of such hairs as are matted in the vitiated discharge of the conjunctiva and Meibomian glands.

To this view of the pathology of entropion must be conceded the merit of being more comprehensive in the consideration of the several causes than any which has preceded it. If we could venture to offer any suggestion to an oculist of the great experience and accurate observation of Mr. Guthrie, we should say, that in explaining the phenomena of inversion, not only the circumstances enumerated by him are to be taken into account, but more especially the physical properties and the mechanical configuration of the tarsal cartilages. Every case of entropion is preceded by inflammation of these bodies, the effect of which is to increase considerably their natural hardness and firmness. The inflammation also causes excessive contraction of the ciliary part, especially of the *orbicularis*, which, however, would be of little moment, but for the firmness and the semicircular shape of the tarsal cartilage. Such is the operation of this contraction under these circumstances, that after the eyelids have been forced to their utmost over the eyeball, while the two extremities can be moved no further, the intermediate circular segment of the tarsus is all at once made to describe a circular motion inwards and upward on the eye, the centre of which motion is a point intermediate between the two extremities of the tarsus and the origin or acting point of the ciliar muscle.

That this takes place may be clearly proved by the examination of a few cases of the dis-

ease, in which the middle part of the tarsus is always found more inverted than the two extremities. That the motion depends on the increase of the natural firmness and the semi-circular shape of the tarsus is obvious to every one who understands the laws of mechanics, and may be readily illustrated by observing the motion which takes place in a rigid elastic hoop, the two ends of which are fixed, while the central portion is under the operation of a moving power.

The same circumstances account for the fact remarked by all practical oculists, but by no means satisfactorily explained, that entropion is infinitely more frequent in the upper than in the lower eyelid. The former is more extensive, or is the segment of a much larger circle than the latter, and hence is much more readily operated on by the orbicular muscle, and much less easily restored to its natural direction. It is only in this manner also that can be understood the vicious bending and curvature of the cartilages so strongly insisted on by Mr. Saunders, and also by the present author, and the contraction of the angles to which the disorder is ascribed by Mr. Crampton. This vicious curvature is the joint effect of morbid induration of the tarsi, bodies naturally firm and unyielding, and the internal projection occasioned by the excessive action of the orbicular and ciliar muscles. When inversion is once completed, it is easy to see how difficult it must be to restore the cartilage to its original position.

In considering the treatment of this disease, Mr. Guthrie enumerates the methods which have been in use at different periods from the time of Galen, Antonius Musa, Celsus, and Paul of Aegina, down to Heister, Maitre Jan, St. Yves, Scarpa, Monteggia, and the recent German oculists. Saunders, it is well known, one of our most ingenious and rational oculists, declared that in the inveterate and established form of entropion nothing short of extirpation of the tarsus is effectual. But Mr. Guthrie has had occasion to witness living monuments of the insufficiency of this measure, even in the persons of patients on whom Mr. Saunders had himself performed this operation. A more effectual remedy he has found in modifying the method originally practised by Mr. Crampton. This consists in dividing perpendicularly by the knife or the blunt-pointed scissors as much of the eyelid close to the external angle as renders it perfectly free, and in the same manner at the inner angle, but without including the *punctum lacrymale*. When these incisions are made to the requisite extent, the elasticity of the tarsus, no longer confined by the bridling effect of the angles, may be so considerable as at once to return the eyelid, tarsus, and eyelashes to their natural position. Where this does not take place, either from lateral adhesion, or from extreme induration and habitual curvature of the tarsus, the attachments should be divided, and the incisions prolonged, and the part of the eyelid included between them must be completely everted;

and it may be even requisite to divide the tarsal cartilage through its most indurated and contracted point. Of the division of the conjunctiva inculcated by Crampton, Mr. Guthrie disapproves as unnecessary, and even injurious.

When these essential parts of the operation have been completed, a fold of the skin of the eyelid between the incisions should be raised by the forceps, and cut away by the curved scissors; the requisite ligatures are to be inserted, and the usual dressings to be applied. The details of the after-treatment may be found in the work itself.

The effects of this operation are illustrated by the relation of six cases, in which its success was complete.

In slight cases the application of concentrated sulphuric acid, as originally practised by Helling of Berlin, and afterwards by Quadri of Naples, may be sufficient to effect a cure.

Ectropion, or eversion of the eyelids, is much more common and much less serious, and is rather a complaint unsightly to the spectator, and annoying to the patient, than productive of much real distress. In a slight degree it is exceedingly common as a consequence of chronic inflammation, when the eyelids are villous, or granular, or hard as cartilage. It may occur in the young after long-continued or repeated attacks of palpebral inflammation, often called strumous, and certainly occurring chiefly in strumous habits. It may take place in the adult under the same circumstances. And in the aged it is frequent as an effect of repeated inflammation of the conjunctiva, where great relaxation of the parts combines with a loaded state of the vessels to prevent restoration to the sound state. In these several forms it constitutes the *lippitudo* of the Romans.

In explaining its etiology, Mr. Guthrie directs the attention of his reader, not only to the swelled state of the palpebral conjunctiva, the diseased Meibomean glands, the successive decision of the eyelashes, and the morbid secretions issuing from these parts, but to the excoriation, hardening, and shrivelling of the skin, produced by these irritating secretions. The fungous state of the conjunctiva, on which Scarpa has laid great stress, is neither an essential cause of eversion, nor when present always produces it. The contracted indurated state of the skin of the eyelid is, on the contrary, invariable; and between the degree of this change and that of the eversion a very exact relation may always, according to Mr. Guthrie, be traced.

In this representation Mr. Guthrie may be right; and it would be improper to deny unconditionally the accuracy of his observation with regard to the influence of the shrivelled skin in producing ectropion. We cannot refrain, however, from expressing the opinion, that Mr. Guthrie, in his anxiety to assign to the skin an important part in the formation of this complaint, overlooks, as he does with regard

to entropion, the influence of the physical properties and shape of the tarsal cartilages. It is to be remarked, indeed, that nothing tends so readily to evert the tarsus as the swelling of the chronic palpebral inflammation; that when once this swelling attains a certain point, the same circumstances which we noticed produce inversion, will now operate with equal facility in producing eversion; that even the simple action of shutting the eye forcibly in this state causes eversion; and that the shrivelled state of the skin is to be viewed rather as an effect than a cause of the disease.

The justice of these observations is, we conceive, strongly evinced in the second sort of ectropion mentioned by the present author,—that resulting from acute inflammation. It is matter of notorious observation, that in acute purulent ophthalmia, both of infants and adults, nothing is more common than more or less eversion of the eyelid, which subsides in general, unless the conjunctiva has been rendered villous and granular. In this case the eversion is permanent, and requires the use of remedies.

The only instance in which the contraction of the skin can be justly admitted to be an essential cause of ectropion is in that of the third species of Mr. Guthrie,—the eversion in consequence of the cicatrix of a wound or sore in the immediate vicinity of the eyelid. The mechanism of this process, and the circumstances under which it occurs, are so well understood to the surgeon, that it is unnecessary to take up the time of the reader with the details, which may be read in the work of Mr. Guthrie.

A fourth form of the complaint is that which depends on the conjunct effect of palsy and slight chronic inflammation of the palpebral conjunctiva. What muscles are affected in this palsy Mr. Guthrie does not mention. It is manifest that the lower eyelid, in which chiefly this variety of the disease occurs, is connected with no muscle which could produce the effect alleged; and that the only loss of power which can be physiologically admitted in this case, is that relaxed and flaccid state of the parts, which is nearly uniform at an advanced period of life. With the distended, varicose, and often villous state of the palpebral conjunctiva, this is amply sufficient to produce that peculiar haggard eye which has been truly said to be “quenched in the rheums of age.”

The treatment of the several varieties of ectropion is regulated on much the same principle, and effected nearly by the same means. In laying down his indications, Mr. Guthrie allows himself, in our mind, to be misled and embarrassed by his hypothesis of cutaneous contraction; and in his first species the first indication is to relieve the contraction of the skin; and the second, to return and retain the lid in its proper situation. If the skin were really shrivelled, we fear the zinc ointment could not effectually relax it. It is chiefly to the treatment of the diseased conjunctiva, that

the replacement of the tarsus is to be ascribed. Mr. Guthrie recommends the method by the concentrated sulphuric acid applied to the everted surface of the eyelid. After six or eight applications, at the interval of four or five days, of this remedy, which has the effect of cauterizing the diseased surface, which is then thrown off by sloughing, the thickening of the conjunctiva is much diminished, and the tarsus is considerably retracted to its natural position. The cure may be then completed by the use of any of the stimulant ointments.

In the employment of the acid, care must be taken not to allow it to touch either the eye or the ocular conjunctiva, and not to allow it to proceed so far as to induce inversion, which has happened.

In the second form of ectropion, the villous state of the conjunctiva is best removed by the frequent, but light and careful application of the lunar caustic. When it is the consequence of acute inflammation, and consists chiefly in loaded vessels, in which the blood stagnates, and is prevented from returning by the partial strangulation of the eyelid, scarifications and mild astringents are the proper remedy.

Ectropion resulting from the contraction of a scar is very difficult to remove. Mr. Guthrie shows that the cicatrix must be extirpated, and a new one by granulation must be formed. The principal to be kept in view in this case is the same, as that on which Mr. Earle operated in relieving the unsightly contractions, which result from badly healed burns.

On eversion of the upper eyelid, or the hare-eye (*lagophthalmos*), a much less frequent complaint, Mr. Guthrie delivers some judicious observations.

Relaxation of the upper eyelid (*πρωσις blepharoptosis, atoniblepharon*) depends on loss of power, congenital or acquired, in the *levator palpebræ superioris*. Mr. Guthrie ascribes it also to œdema, to relaxation of the skin, or to an atony of the eyelid. Perhaps, if it cannot be traced to palsy, to some of the premonitory symptoms of apoplexy, to hysteria, or to epilepsy, it may always be referred to that nervous, or rather relaxed and atonic state of the system, which results from disorder of the alimentary function. In such circumstances, the proper remedy is the removal of the disease of which it is a symptom.

On the subject of *adhesion of the edges of the eyelids*, and *wounds of the eyelids* it is unnecessary to dwell. Under the latter head, Mr. Guthrie enters at some length into the consideration of that variety of amaurosis, which occasionally succeeds injuries and wounds of the contiguous parts.

It has been generally imagined, that, when loss of vision, with diminution of the transparency of the cornea and humours, succeeds wounds or other injuries in the neighbourhood of the organ, it is caused either by concussion of the organ, or by some mysterious nervous operation. Mr. Guthrie thinks, however, that defective vision, or complete privation of sight, rarely takes place, unless in consequence of injury of some nervous branch, sufficiently

considerable to admit of demonstration by dissection. These wounds or injuries may be situated either on the forehead, towards the nose, implicating the supra-orbital branch, and the nasal branch of the first division of the fifth pair,—or immediately below the eye, affecting the second division of the same nerve. It is not necessary that injury be inflicted on the eye itself; and it is well established that the impaired vision, is the sympathetic effect of injury done some of the ophthalmic system of nerves. It is remarkable that the loss of vision is almost never immediate. In most instances, it is observed to approach slowly during the process of healing; and in some it appears only when cicatrization is complete.

The mode in which these injuries operate, is understood by reflecting on the arrangement and distribution of the ramifications of this ophthalmic division of the fifth pair. The researches of J. Frederic Meckel and of Zinn, showed that the white radiated fibres in the uvea or posterior part of the iris, consist chiefly of nervous filaments, which proceed from the lenticular or ophthalmic ganglion; and as this body is formed principally of nervous twigs, from the first branch of the fifth pair, the influence of its integrity, or its lesion over the functions of the iris is obvious.

In some few instances, the deprivation of sight is said to be instantaneous; and in these Mr. Guthrie is of opinion, that the eye itself has suffered from the general concussion,—that is, we imagine, from the shock inflicted on some part of the bony orbit. That this opinion is well founded will be readily admitted, by those who know with what facility a blow inflicted on a hard body, as bone is propagated from the point of percussion to one more remote. Thus, a blow inflicted on any part of the orbit from the external orbital to the internal orbital process, or even on the lateral part of the frontal bone, may follow such a direction as to expend the sum of its force somewhere in the bottom of the orbit, and affect severely the choroid and retina. The first effect of this, may be analagous to the first effect of a similar blow on the head,—viz. concussion more or less severe, and consequent derangement or interruption of function, or even hemorrhage from lacerated vessels. In the latter case, more or less extravasated blood is generally seen in some part of the posterior chamber, or in the vitreous humour. The second effect is quite similar to the secondary effects of blows on the head, viz.—a degree of inflammation more or less severe, and more or less distinct. It will depend very much on the sagacity of the practitioner, and on the activity and promptitude of the subsequent treatment, whether the choroid and retina are not permanently and irretrievably injured.

This, we conceive, is the true theory of impaired vision, supervening immediately or soon after blows on the orbit, without demonstrable injury of nervous filaments. It also affords the explanation of the fact, that, in some instances the vision is abolished only in part, or

in one-half of the organ. It finally suggests the appropriate treatment,—a point on which Mr. Guthrie deems the interposition of the oculist as unavailing. It is manifest that the injury ought to be treated on the same principles, as the effects of injury or violence in general.

We must not omit to notice, nevertheless, that the present intelligent surgeon is by no means entirely unaware, of the true nature of the consequences of this species of injury. He justly remarks, that every wound of the forehead implicating the fifth pair of nerves is not succeeded by amaurosis, and conversely, that many cases of defective vision accompanied by wounds, depend on other injury than that inflicted on the forehead. He seems to think that the injury may have been inflicted directly on the eye, in which extravasation or marks of laceration are sometimes manifest. But even this supposition, as we have shown, is unnecessary; for violence on the forehead, without any injury of the nerve or eye, is perfectly competent to produce the effect in question.

Mr. Guthrie gives no encouragement to the practice of Beer, which consists in dividing the nerve down to the bone, in cases supposed to depend on injury of the ophthalmic branch of the fifth pair. It is easy to discover the real cause of the favourable results obtained by this oculist, and the want of success in the hands of Scarpa, Guthrie, and others. The oculist of Vienna divided the nerve at once, without knowing whether in any given case the amaurotic blindness was to ensue. Now, as Mr. Guthrie has justly observed, not every case of nervous injury is followed by defective vision; and to this it may be added, that in several, in which vision becomes impaired, it is spontaneously recovered after some time without known cause. On this head, we may refer the reader to some good observations by Benedict, in his eleventh book on Traumatic Ophthalmia.

In the chapter on tumours, a good deal of miscellaneous matter is introduced. The pathology of styne is correctly stated; but it appeared to us unnecessary to refute the erroneous notion, that this disease consists in inflammation of a Meibomian gland. In this meridian, at all events, Mr. Guthrie may be assured, it was never understood to be any thing else save inflammation of the cellular tissue, between the delicate skin of the eyelid and the tarsal cartilage. Conversely, we think *chalazeon* is very often, if not always, an enlargement of a Meibomian gland. On the removal of encysted tumours, which are the same in the eyelids as elsewhere, the reader will consult the work itself.

Encanthis, it is well known, consists in enlargement of the *caruncula lacrymalis*, implicating also the semilunar valve, and spreading to greater or less extent along the edge of either eyelid. This disorder Mr. Guthrie justly views as the result of inflammation ill treated, neglected, or passed into the chronic state. Of the inveterate stage and cancerous form

described by Scarpa, he repeats the description of that author.

In treating this disorder, he recommends antiphlogistic means in the early stage and inflammatory form, the use of the scissors in the case of excrescences or mulberry growths, and the extirpation by ligature, or the knife, when it is large and likely to prove malignant.

On the nature of *Pterygium*, he differs from Scarpa entirely. This eminent pathologist, it is well known, regards *pterygium* as an effect of chronic ophthalmia, and as consisting in a relaxed varicose state of part of the conjunctiva. From very great experience in the treatment of chronic inflammation, as also from the observation of several friends, who have examined the pensioners discharged in consequence of diseases of the eye, Mr. Guthrie thinks he is justified in doubting the soundness of this opinion; and he further infers, that not only is true pterygium rarely the consequence of inflammation, but that it differs essentially, from those nebulae of the cornea with which Scarpa has classed it. Mr. Guthrie, however, does not state very clearly his own opinion on the nature of this growth. But from his description it may be inferred, that he regards it as a membranous growth or production from the conjunctiva. Perhaps the difference between this, and the view of professor Scarpa, is more imaginary than real.

The operation is minutely and accurately described. The sum of it may be said to be, that the growth must be removed by the knife; and if fungous or unhealthy granulations succeed, the scissors, with the occasional use of blue vitriol or lunar caustic, are to be employed. When the pterygium assumes a cancerous aspect, removal of the contiguous part of the eye may be requisite; and if farther advanced, extirpation of the contents of the orbit may be the only remedy. On the observations on the removal of extraneous substances from the eye, and on injuries of the eyeball, though judicious and instructive, it is unnecessary to dwell.

In the next chapter, on tumours formed within the orbit, and protrusion of the eyeball, the reader finds much interesting matter. It would, however, have been better had Mr. Guthrie altogether separated suppuration of the bottom of the orbit, from encysted and other tumours occurring in that situation. The first not only differs in nature, but demands a different line of treatment entirely. In the former case, simple incision or puncture may be sufficient to effect a cure. In the latter, extirpation generally in the case of encysted tumours, and always in the case of sarcomatous or malignant growths, becomes a necessary measure.

This proceeding, though attended with no alarming hemorrhage, is by no means free from danger. The necessary incisions may be followed, Mr. Guthrie has shown, with severe erysipelatous inflammation; or, if the tumour is attached to the periosteum of the orbit, with inflammation, spreading to the dura mater, cerebral membranes, and the brain, so as to

prove fatal in a very short space of time. Of the latter, the author quotes a good example from Langenbeck. It is the duty of the surgeon in such circumstances, to watch his patient with the most assiduous vigilance and circumspection, and upon the first appearance of inflammatory symptoms affecting the brain, to put the antiphlogistic treatment in prompt and energetic employment.

To tumours behind the periosteum, whether issuing from the bone, or connected with the sphenoidal or ethmoidal sinuses, or proceeding from the dura mater or the brain, the same considerations are applicable.

In each of these cases, in aneurisms of any of the arteries within the orbit, and in tumours, hydatids, or enlargements of the lacrymal gland, more or less protrusion of the eyeball takes place, constituting the affection, known under the general denomination of *exophthalmos*.

Among tumours of the orbit affections of the lacrymal gland hold a conspicuous place. The alleged frequency of these disorders, as maintained by Mr. Todd, is doubted by Mr. Guthrie, who states, that, among nearly 12,000 patients who have attended the Eye Infirmary to which he is attached, he has met one case only of suppuration, and none of scirrhus. In proof of the accuracy of the statement regarding the latter disease, he further adduces the testimony of Beer, Schmidt, Desault, and Boyer, according to whose observations scirrhus of the lacrymal gland is never seen primarily, and is met with only as a consequence of cancer of the eye. Richerand quotes a single case, in which Guerin extirpated the gland, and which he is disposed to regard as the only example of isolated scirrhus, or independent of cancer of the orbit. Warner, on the contrary, several times saw it so changed in structure as to require extirpation. Demours states that he has seen several cases of it. Travers removed the gland entirely in a state of true scirrhus; and Todd has more than once performed the same operation. These facts show that it is difficult to draw any general conclusions, regarding the comparative frequency of primary cancer of the lacrymal gland. The remedy is extirpation, the manner of performing which, is given in the cases of Mr. Todd and Mr. O'Beirne.

Of *Staphyloma* Mr. Guthrie admits two forms. The first, however, is rather to be viewed as an instance of extreme thickening, with some opacity of the cornea, which is more spheroidal and prominent, than natural, but through which the iris can still be distinguished. It is not at all wonderful that this form of morbid change is quite irremediable. The second is the ordinary form of staphyloma described by Richter, Scarpa, Beer, Schmidt, and all the writers on ophthalmic surgery.

The anatomical characters of this disease, which is the consequence of inflammation, have been represented by most of the foreign oculists, to consist in swelling or thickening of the cornea, outside and inside, with swelling and protrusion of the iris, which is made to

adhere to the inner surface of the cornea. This is matter of fact, which cannot be denied. But they have imagined another circumstance of a more doubtful nature, the reality of which Mr. Guthrie justly questions. We allude to the idea, that the secretion of the aqueous humour in the posterior chamber proceeds, while the cornea yields to pressure, is distended, and becomes staphylomatous. It is not difficult to show, that this is assuming an event posterior in its existence, to account for another already established. In point of fact, the staphylomatous protrusion of the cornea, has taken place previous to any unusual accumulation of aqueous humour; and Mr. Guthrie has been at some pains to show, that whatever accumulation takes place, is by no means sufficient to produce the inordinate swelling of the cornea.

Staphyloma has been observed to be frequent in infants and children, more especially after the pustular inflammation which not unfrequently attacks the cornea during or towards the termination of confluent small pox. Scarpa attempted to show that this prevalence of staphyloma in young subjects depends on the pulpy and succulent texture of the cornea at that period of life. A more probable explanation of this fact is derived by Mr. Guthrie, from the proneness which variolous inflammation attacking the cornea manifests to produce ulceration of that membrane. The hypothesis of Scarpa is further invalidated by the fact, that staphyloma may succeed every inflammation of the eye in which the cornea is severely affected through its substance. Thus purulent ophthalmia, when epidemic in the army, afforded a large proportion of cases of staphyloma; and Mr. Guthrie refers this event only to the sloughing and ulceration which that disease often produced. We have seen genuine staphyloma take place in consequence of acute inflammation of the eye ascribed to the presence of a minute quantity of quicklime. Does the sulphuric acid when maliciously thrown into the eye produce the same result?

In every case of genuine staphyloma the eye is rendered utterly useless as an organ of vision; and the duty of the surgeon is confined to the means of affording relief from the irritation resulting from the inordinate projection, and occasional mechanical inequality of the anterior surface of the eye. The precise object of the surgeon in affording this relief has never been very distinctly stated by authors; and the student is hence told in general terms, that the operations for staphyloma are effected either by caustic or by the knife. Even the present author has not attempted to refer his curative means to one or two general principles; and the reader is allowed to collect the results from a variety of statements not altogether naturally connected.

Richter alone, in practising the use of escharotics to produce a small ulcer, avowed it to be his purpose to *evacuate the thick tenacious* humour, which is the immediate cause of the opacity and unnatural tumefaction of the cornea. The benefit of this method, after re-

peated trials, is denied by Scarpa, who is therefore charged by Mr. Guthrie with not understanding the intention of Richter, and the manner of its application. Mr. Guthrie might have justly taken the present opportunity of stating succinctly the theory of the operation.

In all cases of staphyloma the objects to be held in view are the restoration of the natural shape and spherical figure of the cornea; and in most cases this is to be effected by removing irregularity, and diminishing undue prominence. The first of these objects may be effected by caustic or by the knife, used in such a manner as to remove successively any point more projecting than another. The second is to be done by evacuating such fluid, whether it be part of the aqueous humour degenerated into an opaque fluid, or a new secretion, as contributes with the thickened cornea to inordinate convexity and prominence of the eyeball. With this view any of the potential caustics may be employed, as Richter recommended, to produce a slough, which, when thrown off, leaves an opening, through which the morbid fluid trickles, till its entire discharge allows the cornea to subside. When the knife is employed, in consequence of the proximity of the iris to the cornea, not only the crystalline lens, but the vitreous humour may escape. But as the eye, notwithstanding the assertion of Demours, is invariably useless, this is injurious in no other mode than as inducing too great diminution of the eyeball.

From *extirpation* we pass to the lectures on cataract, its varieties, and the several modes of operation.

These lectures are numerous, elaborate, and minute; and as we cannot hope to give any thing like a comprehensive view of the subjects treated, and the questions discussed by the author, we shall merely direct the attention of the reader to the subject in a very general manner.

It is well known that the anatomical character of cataract consists in more or less opacity of the crystalline lens, or its containing capsule, or of both. The causes which tend to produce this diminution of transparency are by no means satisfactorily known; and surgeons have been contented with enumerating all the circumstances under which cataract has at any time been observed to take place. An opinion very generally prevalent of late years is, that cataract or opacity of the lens is the effect of inflammation, especially of the capsule; and this is doubtless observed to take place in syphilitic or mercurial inflammation of the iris, and other internal tissues of the eye. Professor Walter especially has remarked a wreath of vessels at the pupillary edge of the iris sending vessels to the centre of the anterior layer of the capsule, and a network of vessels issuing from the posterior layer into the substance of the lens,—both of which, he conceives, are morbid, and constitute the agents of that alteration in its structure which impairs its transparency. Mr. Guthrie, while he admits that this appearance is that of in-

inflammation of the lens, and that it may produce one species of cataract, denies, however, that it can account for all. It is, he justly remarks, inflammation propagated from the contiguous tissues to the capsule, and doubtless diminishing the transparency of the lens, but forming not a true but false cataract. In some instances even the lens is not affected; and when the inflammation has subsided, the white, gray, or brown appearance of the capsule disappears entirely, and the parts become again diaphanous.

He takes the same view of the theory lately advanced by M. Gondret, regarding the inflammatory origin of lenticular or capsular opacity, and in short of all those instances of cataractoid blindness coming on suddenly and from obvious causes. "If inflammation," he contends, "be the cause of pure lenticular or capsular cataract, it is inflammation *sui generis*, depending on the peculiar structure or organization of the parts, and the progress of which is not likely to be better known to us, until this peculiar structure or organization shall have been more fully investigated." An additional reason might have been added. Whatever be the structure of the capsule, it is almost certain that the lens presents no traces of organization; and it is incompatible with the known laws of pathology to admit the existence of morbid action in parts which are not proved to be organized.

In his classification of the several forms under which cataract takes place, Mr. Guthrie adopts the ordinary mode of dividing the true or genuine, according as they take place in the lens, in the capsule, or in both at once. In contradistinction to these he regards all the instances of opacity in the lens, its capsule, or both at once, which succeed inflammation, as examples of false or spurious cataract.

The species of lenticular cataract are distinguished into hard, fluid, soft, and caseous. This division, however, in its further application, is singularly deficient in scientific precision and clearness. Thus, though Mr. Guthrie informs his readers that the lenticular cataract consists of the four species, or rather sub-species, above mentioned, it turns out, according to the description of Mr. G. himself, that the only instance almost of lenticular cataract is hard,—that the soft or caseous form belongs chiefly to capsular cataract,—and that, though the lens on becoming opaque may acquire a preternatural fluidity, yet the fluid cataract is very frequently, if not generally, found either in the *humor Morgagni*, or in the capsule itself. This want of precision is so much the more to be regretted, that the detailed descriptions of the several varieties are minute, and bear every mark of great accuracy.

It would be unreasonable, with our limited observation, to attempt any correction of the results given by an oculist so experienced as Mr. Guthrie. But, so far as we have been enabled to compare cases of cataract with the distinctions laid down by authors, we think

much confusion and some imagination have all along prevailed in marking the relative consistence of different species and varieties of cataract. Cataract depending on opaque lens is certainly often pretty firm, as represented by Mr. Guthrie. But, notwithstanding the elaborate manner in which he has attempted to distinguish this hard variety of lenticular cataract, we are convinced, from the observation of a considerable number of cases operated on by different surgeons, that it is next to impossible to say, before the needle is introduced into its substance, whether it be hard or soft, fluid or caseous.

The varieties of capsular cataract are much more frequently hard, or at least firm, than those of the lenticular disease; and in general it may be regarded as pretty uniform, that in most cases of capsular cataract, if the lens is in any degree opaque, its consistence is fluid, soft, or caseous. In the latter case it corresponds to the capsulo-lenticular cataract of the present author.

The different modes of operating for the cure of cataract are sufficiently well known. Though various surgeons, and especially Mr. Ware, and more recently M. Gondret, conceived the practicability of restoring the transparency of the eye by various applications without operation, this idea has never gained any firm hold of professional opinion; and the proposal may safely be pronounced as utterly inapplicable to genuine cataract. Mr. Guthrie has given this subject some attention; and though he infers that it is proper to confirm the opinion, that opacities of the capsule may sometimes be arrested, frequently diminished, and occasionally removed, by due appropriation of means, yet this is chiefly applicable to such opacities as are the consequence of common inflammation, or to the true idiopathic cataract in an incipient state. He doubts entirely the possibility of removing a well-formed opacity of the lens either by external applications or by internal remedies.

By the operation for cataract is meant the removal of the opaque lens and capsule from the axis of vision; and this may be accomplished in two modes, either by direct and entire extraction, or by destroying their connexion with their nutrient parts, when they undergo a species of solution, either in the vitreous or in the aqueous humour. According to the mode in which the latter form of operation is effected, it is termed couching, depression, reclinatio, (Willberg and Beer;) or division, or, in general, displacement, (Guthrie;) and according to the mode in which the instrument is introduced for effecting these purposes, before or behind the iris, it is denominated the posterior or the anterior operation, (*keratonyxis*, Conradi, Jaeger, and Buckhorn *κερατονυξις*, *corneæ punctio*.) In either of these cases it is manifest that the eye is deprived of a part, important for its great power in refracting and concentrating the luminous rays; and, consequently, that, as its place is occupied by aqueous humour only, vision can no longer be the distinct and per-

fect process which it was in the original condition of the organ. This conclusion, derived from optical principles, accurately corresponds with the state of eyes which have been deprived of the crystalline lens in the operation for cataract. The vision is indistinct, in consequence of the low and irregular refracting power of the medium which is substituted for the lens; and this defect can only be remedied by the use of an artificial lens in the form of a convex glass, which supplies the deficiency of concentrating power. It is hence necessary to explain to patients, that the operation for cataract, though requisite as the only means of removing an opaque body, the presence of which forms an impassable barrier to the rays of light, cannot, nevertheless, restore the degree of vision originally possessed by the sound organ.

Much has been said by different oculists on the proper period for operating, on the propriety of operating when only one eye is affected, and in the case of both eyes, on the propriety of operating on both at the same time. These several topics Mr. Guthrie discusses with much deliberation and acuteness, and is at some pains to explain the principles by which the oculist is to regulate his proceedings. He directs the attention to the circumstances in the general constitution of the eye and its textures, which favour and contraindicate operation.

In opposition to the opinion of Samuel Cooper and Mr. Travers, that the objections against operating in the case of a single cataractous eye, the other being sound, he scruples not to say, that, as far as the improvement of sight is concerned, the operation ought not to be attempted on one eye while the other remains sound. He admits, that, if the sight of the sound one becomes deranged from the commencement of cataract or any other cause, the objection is completely obviated. In local or accidental cataract he does not believe that the presence of an opaque lens in one eye exercises any influence on the other; nor would he trust to its removal for preventing the formation of opacity in the other at any subsequent period. The only reason which he admits for justifying an operation under such circumstances, is to remove deformity, and restore to the countenance that intelligence which is much diminished by the presence of the opaque lens.

The opinion that the removal of cataract from one eye will prevent the formation, or cause the disappearance if forming, of opacity in the lens of the other, has been lately revived by Mr. Stevenson. This point has been considered with much attention, and illustrated with a good deal of curious matter by Mr. Guthrie, who thinks, on the whole, that there is some ground for that part of the assertion of Mr. Stevenson, that "the removal of cataract from one eye may cause the disappearance of an incipient opacity in the other." In four cases out of a very great number he has seen the removal of an opaque lens from one eye succeeded by the disappearance

of an incipient opacity, probably of soft consistence, and the consequence of capsular opacity in the other. But he has not had occasion to remark the disappearance of a well-formed opacity of the lens, evidently hard, in consequence of operation on the other eye; and he believes, therefore, that no such result takes place when the lens alone is opaque, and especially where it is indurated. On the contrary, he selects from a great number of cases, four in which the operation was highly successful in all respects, in which, nevertheless, the completion of cataract in the opposite eye was not prevented.

In the case of opacity of both eyes Mr. Guthrie is decidedly hostile to the practice of operating on both at once as a general rule. The exceptions he derives, as Beer does, from those circumstances, either necessary or accidental, which may render success doubtful; but the final result may be understood from the following avowal:—"If I were the subject of this disease myself, I should choose to have one eye operated on first, and the second done at a subsequent period." When cataract is completely formed in one eye long before it impedes vision in the other, he advises the patient to submit to his disease, keeping his health in good condition, until the eye last affected became nearly unserviceable, when the operation might be conveniently performed on that first affected.

The different modes of operating practised by different oculists are described most minutely and accurately; but for these details we refer to the volume itself. We shall simply notice one or two points relative to the comparative merits of the several modes of operating.

In all cases of operation it is requisite previously to dilate the pupil by means of hyoscyamus or belladonna. It is singular that Dr. Bowen of Naples claims, in his Treatise (published in 1823) on *Hyalonyxis*, or the operation by piercing the vitreous humour, the merit of recommending this practice. In preferring this claim, he very unguardedly exposes himself to the charge of complete ignorance of the practice of the majority at least of oculists in this country. Mr. Guthrie states that, in the first edition of the present work published in 1823, he recommended the use of belladonna for dilating the pupil, previously to any operations within the eye, as a practice which he had followed for years, and which he did not conceive to be any thing new. We can state positively that in 1816 and 1817 the practice of dilating the pupil by means of belladonna was in constant and established use in the hospital of this place in every operation to be performed for cataract, whether by depression or extraction. There is no doubt, from the testimony of Conradi, Langenbeck, and others, that it was in use in Germany long before this period.

Extraction, which alone is entitled to the character of a radical cure, though competent to all, is indispensable only in cases of cataract depending on induration of the lens.

It is, nevertheless, neither expedient nor practicable in all cases of hard lens, since there are many circumstances in the eye or its appendages, or in the constitution of the patient, which may render it uncertain, if not quite inadmissible. Thus, to the success of its performance it is indispensable that the eyelids open well, be free from inflammation or any of its consequences, as œdema, granulation, and disease of the Meibomian glands; that the lachrymal passages be healthy, and the eyelashes straight; that the eye itself be neither too much sunk in the head nor too prominent; that the cornea be transparent, sound, and free from inflammation; that the iris be plane, its pupillary margin free from adhesions, and the anterior chamber of its ordinary dimensions; that the pupil be steady and regular in its motions, yet not too dilatable; that there be neither glaucoma nor amaurosis; and lastly, that the patient be free from pectoral disease, gout, rheumatism, or other disordered states, which, by impairing the vigour of the constitution, may predispose to unhealthy inflammation or other unfavourable results.

The principal evils against which the operator should be on his guard in this operation, are injury of the iris, laying the foundation for protrusion of that membrane, its implication in the wound, and irregular or even closed pupil; expulsion of the vitreous humour; and suppuration of the eye. To obviate the first set of evils the choice of a proper eye, caution in operating, and care in the after-treatment, are generally sufficient. The second accident is injurious rather from the inflammation which succeeds, by the glutinous matter of the vitreous humour adhering to the incision, than from the actual loss of that humour. According to Mr. Guthrie, if one-fourth of the vitreous humour be lost, the sight is scarcely impaired; if the loss amount to one-half vision will be imperfect, and the result may be doubtful; but if a larger quantity escape, the collapse of the eye may be fatal to the organ, (p. 335.) It is best obviated by placing the patient immediately in the horizontal position. The third accident may occur under any circumstances, but is most likely in unsound constitutions. It can be resisted in no other mode than by prompt and energetic antiphlogistic treatment.

Lastly, against extraction it may be urged, that, if it fail in the first attempt, it is not capable of being performed a second time. The operation of displacement again, comprehending depression and reclination, may be performed in all cases in which extraction is practicable, and in several in which it is inadmissible. It is applicable to all cases of hard lenticular cataract in which operation is advisable. It may be performed when the eye is so deep in the orbit as to render extraction difficult; when the eyelids are contracted or diseased; when the lachrymal passages are affected; when the cornea is partially opaque, or inflamed, or flattened; when the dilatation of the pupil is regular; when the iris is vibratory; when, in the case of operation being other-

wise desirable, doubts are entertained as to the sound state of the eye; when the motions of the organ are unsteady or spasmodic; and, lastly, when the health of the patient is doubtful.

Against this operation, however, various objections have been urged by Wenzel and the other partisans of the method of extraction. These objections Mr. Guthrie has combated with great sense and force of reasoning, and we think with perfect success. He has in truth placed the relative merits of this operation in the clearest light; and whoever still entertains doubts of the propriety of the method by displacement should peruse and carefully consider what he has said on this subject in the present work.

The only serious objection is that of rising of the lens, sometimes perhaps years after depression. On the supposed causes of this, and especially the influence of vitreous humour on re-elevating the lens, Mr. Guthrie makes some judicious observations. He shows that the arrangement of the vitreous humour in the cells of the hyaloid membrane prevents the lens from passing through any part of this humour, except that by which it has been depressed, so that the latter rises nearly as it has been pushed down, but does not occupy exactly the same situation.

Reclination through the cornea, (*keratonyxis*,) Mr. Guthrie regards as possessing no advantage over that through the sclerotic. He admits, however, that between the former and the old operation of depression there is no comparison. The operation by dividing the capsule and lens is applicable to cases of soft cataract only. When *cut up*, as it is termed, in this manner, the fragments are supposed to be absorbed, or rather dissolved in the aqueous humour. The objections against this operation are of much the same kind as those against the others; and are to be obviated by the judicious adaptation of the method to the case under treatment. According to the testimony of Mr. Guthrie himself, vision is as perfect after this as after extraction. He nevertheless avows his preference to the posterior operation of Scarpa, even in cases of large fluid capsulo-lenticular cataracts.

Congenital cataract differs somewhat in its anatomical characters from the ordinary cataract of adults. Professor Walther supposes that it is not formed in consequence of disease; but that, as the lens is naturally turbid, in the fœtus, it continues so in consequence of some check given to the progressive development of the embryo at some stage of its growth. To this idea it may easily be objected that it is difficult to conceive any cause which could arrest any natural process in the eye, without producing an analogous interruption in all the other processes in the life of the fœtus. Mr. Guthrie admits, nevertheless, that this idea receives some countenance from the fact remarked by him, that the lens and capsule in one species of congenital cataracts in which the capsule is thick and striated, and the lens soft and transparent, never increase in size in

the same proportion with the rest of the eye; and when the pupil is well dilated the small opaque lens may be seen well-defined on the vitreous humour. In such circumstances a sudden check appears to have been given to the growth of the lens at a certain period of the growth of the ovum.

Schmidt, Beer, and others of the German oculists, again, are disposed to believe that many of these cases of congenital cataract, supposed to exist previous to birth, are in truth, the consequence of rupture of the capsule during the violent convulsions which occasionally occur shortly after birth. This supposition arose probably from the circumstance that congenital cataracts are often capsular only, the lens having disappeared by absorption. But it is justly remarked by Mr. Guthrie, that, in admitting convulsive rupture of the capsule as a cause, it must not be forgotten, that few children who have suffered from convulsions have cataract, and that, conversely, cataracts are observed in many children who have never at any time been affected with convulsions.

The opinion of Gibson, and the ingenious hypothesis of Cunningham Saunders on the congenital cataract, are well known to all those who take any interest in ophthalmic surgery. The first denied the fact of absence of the lens, and contended, that, though simple membranous cataract is not uncommon eight or ten years after birth, it is not found in the infant at an earlier period. These cataracts, he believed, were at that time of milky kind, and, the fluid having been absorbed, the opaque capsule which originally contained it, formed the membranous cataract found at a later period of life. Saunders conceived that the lens became first opaque, was forthwith removed by absorption, while the anterior plate of the capsule, retiring on the posterior, formed a hard opaque membranous body in the site of the lens. Mr. Guthrie takes pains to reconcile these two opinions, which in truth differ much less in reality than either of their ingenious patrons themselves imagined.

To Mr. Saunders belongs the merit of demonstrating the general practicability of operating in early infancy. The peculiarity of his method consists, it is well known, in cutting out, as it were, the central portion of the opaque body, generally by the anterior, sometimes by a posterior operation. The experience of Mr. Guthrie on this subject, however, leads him to prefer the posterior operation.

The chapter on the operation for artificial pupil, though a little shorter, is not less elaborate. After distinguishing the operation into four successful methods, division, (*coretomy*, *iridotomy*) excision, (*corectomy*, *iridectomy*) separation, (*coredialysis*, *iridodialysis*), and the union of separation and excision. Mr. Guthrie traces the history of this operation from the days of Cheselden, Morand, Janin, and Sharp, down to those of Scarpa, Gibson, Maunoir, Beer, Buckhorn, Langenbeck, Quadri, &c.

The object of the operation is easily under-

stood. In cases of adhesion, or closure of the pupillary margin of the iris, while the cornea is transparent, and the lens and vitreous humour are presumed to be so, it becomes requisite to make an aperture in the centre of the closed pupil, to admit the rays of light to the humours and retina. As it is impossible to give such an aperture the motions possessed by the original pupil, it is of great moment to accommodate its size to the average extent of the pupil in a moderate light. Though it is rarely practicable to give this aperture the circular form, it is always important to make it approach as near as possible to that of the original pupil.

When an aperture cannot be made in the centre of the iris, the other parts of the membrane are eligible in the following order; 1st, The lower part of the iris inclining inwards; 2d, The internal a little below the transverse diameter of the eye; and 3d, The inferior and external; the upper, the corresponding part of which is covered by the eyelid, being the least eligible. Mr. Guthrie justly prefers the lower parts of the iris, as those through which the line of vision is least incurvated, and therefore less likely to produce squinting. As the cornea, in some cases requiring an artificial pupil, is partially opaque, the situation of the aperture should always be fixed in relation to that which is clear.

After a distinct enumeration of the different states of the eye requiring the formation of an artificial pupil, Mr. Guthrie proceeds to consider the merits of the different modes of effecting it; and while with much judgment he refuses to concede absolute superiority to any one over another, he nevertheless shows that there are circumstances in the different states of the eye requiring operation, which render one mode of operating more applicable and expedient than another.

It would be foreign to the purpose of this sketch to enter into the details of the lengthened inquiry before us. We can assure the student that his labour will be well repaid by a clear and instructive critical view of the proposals and practices of different oculists and surgeons.

The present article, though not short, exhibits little more than a passing glance at the various subjects discussed in the volume of Mr. Guthrie. It has been already said more than once, that these subjects are investigated in the most deliberate and comprehensive manner. We repeat here what has been said at the outset, that Mr. Guthrie has not confined himself to the results of personal experience, however sound that may be, and however extended the opportunities for acquiring it. With much research he has collected information from all the best and most respectable authorities, and with a spirit of liberal and judicious criticism he has endeavoured to explain to the student the comparative merits of the methods proposed by different operators.

In conclusion, it need only be said that the work of Mr. Guthrie exhibits the most comprehensive view of the present state of knowledge

on the operative department of ophthalmic surgery, and communicates in general sound notions on the pathological principles by which operations ought invariably to be regulated. It is, in short, a work which the student of ophthalmic surgery will find it his interest to study attentively and deliberately, and without which no practical oculist can conscientiously exercise his art.

From the London Medical Repository.

The Works of William Cullen, M. D. Professor of the Practice of Physic in the University of Edinburgh: containing his Physiology, Nosology, and First Lines of the Practice of Physic; with numerous extracts from his Manuscript Papers, and from his Treatise of the Materia Medica. Edited by JOHN THOMSON, M. D. F. R. S. L. and E. Lecturer on the Practice of Physic, Consulting Physician to the New Town Dispensary, and late Regius Professor of Military Surgery in the University of Edinburgh. In two volumes; William Blackwood, Edinburgh; and T. and G. Underwood, London, 1827.

The works of Cullen may be supposed to be so well and universally known to the members of the medical profession, as scarcely to require notice here; but if any of our readers should think so, we can assure them that they are labouring under a great mistake. What have been published and hitherto considered as the complete works of this illustrious and celebrated individual, consist of only the bare skeleton of them; and until Dr. Thomson brought out the present edition, the public could form no conception of the extensive and philosophic views which the author entertained of the nature and treatment of disease, nor of the correctness of the principles upon which he founded his doctrines. This edition contains Cullen's Physiology, Nosology, and the Practice of Physic. His physiology is generally less known than his other writings, although an acquaintance with his views of the animal economy is absolutely necessary to a proper understanding of his practice of physic. The lectures introductory to the course on the practice of physic, are published now for the first time; and they contain a great mass of interesting information relative to the history of medicine, from the earliest ages down to the author's own time, and to the plan which ought to be pursued in the study of the healing art as a science.

To the practice of physic, numerous additions are made, in this edition, from Dr. Cullen's MS. lectures, and from a treatise on materia medica published by him in 1789. We consider these most valuable additions, inasmuch as they fully explain the views of the author respecting the nature of disease, and the rationale of the action of medicine on the system in the cure of different maladies.

In order to give our readers some idea of the superior value of this edition over that of

former ones of any of Dr. Cullen's works, we shall extract a passage or two as a specimen. They will have the goodness to observe that the additions made to the present, have *two* inverted commas placed at the commencement and at the end of each passage. We transcribe the first passage from the Physiology.

'XXXIII. As impulse of the bodies on the sentient extremities of a nerve does not occasion any sensation, unless the nerve between the sentient extremity and the brain be free (XXIX. 3.); and as, in like manner, volition does not produce any contraction of muscles, unless the nerve between the brain and muscle be also free, we conclude, from both these facts, that sensation and volition, so far as they are connected with corporeal motions, are functions of the brain alone; and we presume, that sensation arises only in consequence of external impulse producing motion in the sentient extremities of the nerves, and of that motion's being thence propagated along the nerves to the brain; and in like manner, that the will operating in the brain only, by a motion begun there, and propagated along the nerves, produces the contraction of muscles.'

"Sensation and volition, as far as they are connected with corporeal motions, are functions of the brain alone. This is put here with a view to a controversy, which has long subsisted in the schools of physic, viz. *What is the seat of the soul?* With many it is considered as diffused over the whole system, so that it perceives in the eye, and operates in the muscles; while others say that it is immediately and only connected with the brain, which has therefore been called the *sensorium commune*. Another statement of the question is, whether the soul occasionally acts in every part of the body, or if there is a *sensorium commune* with which alone it is connected? I maintain that there is a *sensorium commune*, and that this is the brain taken in its largest extent, the *cerebrum*, *cerebellum*, &c., and I have concluded this from the facts alleged. This may be illustrated with regard to both *sensory* and *motory* nerves, but it is clearest with respect to the latter. If you apply a ligature upon such a nerve, it has the effect of interrupting all power of will over the muscle. We might indeed suppose that the brain has nothing to do with this, and that it is owing to a superior portion of the nerve; but the contrary appears when the ligature removed to a part nearer the brain has the same effect. But the experiment may be diversified. We know that besides the power of the will there are other powers which excite the contraction of the muscles, and which should have been described in XXXII. when I said that the example adduced (sensation and volition) is not the only way of communication between the parts of the nervous system. Thus, the pricking of a needle between the ligature on the nerve and its extremity produces a contraction, while the will has no such power; but if we carry a puncture between the ligature and brain, we can produce no such action of the muscle. If a ligature or compression be applied to a

nerve of sense—of the latter of which we have frequent instances in the optic nerves—the impression, of light for instance, does not produce its peculiar sensation; but if we can go beyond the ligature, and apply a puncture between it and the brain, this will occasion a sensation, whilst there is no sensation by any application between the ligature of compression and the organ.

“This, I think, points out clearly that, from the part on which the impression is made, some motion is excited, and that this can be carried to the other extremity of the nerve. I say, therefore, ‘we presume that sensation arises only in consequence of external impulse producing motion in the sentient extremities of the nerves, and of that motion’s being thence propagated along the nerves to the brain.’ It is in consequence of its arriving in the brain only that sensation is produced; so that sensation is a function of the brain alone: the soul perceives in the brain only, and not in the sentient extremities.”

The next passage is taken from the author’s Introduction to the Practice of Physic:—

‘III. The prevention of diseases depends upon the knowledge of their remote causes; which is partly delivered in the general Pathology, and partly to be delivered in this treatise.’

“We observe, that almost every event may be considered as a part of a chain or series of causes which have in that series produced one another, and which, therefore, have produced the last effect, which we consider; and in so far every part of the chain may be considered as a cause of the last effect. Thus, a man on board a ship takes up a lighted match, and applies it to the touch-hole of a loaded cannon; this kindles the gunpowder; this produces an explosion, which pushes on with great rapidity the bullet; this bullet strikes on a piece of timber, divides it into splinters; these splinters happen to hit with great force the head of a man standing by, so that he is instantly killed. Now this death may be traced through this whole series of causes. The same applies to most other events in nature; and hence it is common to apply the term cause to each of these actions or motions. There is often, however, a necessity for distinguishing them into the more immediate and remote causes: in the above case, the stroke of the splinter was the immediate cause of the man’s death; the whole series besides this were the remote causes. This very necessary distinction has been much employed in physic, and has given rise to the terms *proximate* and *remote* causes.

“Disease, considered as the effect of a particular state of the body, may be traced backwards in a series of causes, all of which may be called remote; but physicians have not been thus limited in taking the very immediate as the proximate cause. This will be best understood by an example. Pain in a joint constitutes the disease we call rheumatism; in tracing the causes, we find that pain is owing

to an over-distention of the sensible fibres, in consequence of an overstretching of the blood vessels. We further find, that this overstretching is caused by the increased impetus of the blood from a stimulus applied to those vessels, often to the whole system, but often to particular vessels; and that this has for its cause the application of cold. Now the application of cold may be said to be the only proper remote cause; but the stimulus, the increased impetus, the overdistention, may all be considered as proximate causes.

“That the meaning of this may be better understood, we take another example. A fluctuating swelling of the abdomen forms the disease which we call ascites. We find that it has for its cause a quantity of water collected in the cavity of the abdomen, which may be further traced to an increased exhalation or effusion of the halitus that is constantly thrown into the cavity of the abdomen. This we may trace to some resistance to the motion of the blood in the veins of the abdomen, which may have for its cause a congestion of blood in the liver, arising again from a suppression of the hæmorrhoidal flux; and this, lastly, may have been produced by the external application of cold. Every link of this chain, again, may be said to be a cause of the ascites, some links being more immediate, and others more remote; yet physicians would, in this case, consider only the cold applied as the remote cause, and the suppression of the hæmorrhoidal flux, the congestion of blood in the liver, &c. as parts of the proximate cause.

“A scientific practice of medicine is founded upon the knowledge of the *indications*, of the changes to be produced in the body in order to cure a disease: whatever gives this indication is a part of the proximate cause; whether there be a series of causes and effects, or whether they act concurrently at the same time, if they continue to operate, and have a share in the effects observed, they are all considered as the proximate cause. It is often very difficult to assign the limits between remote and proximate causes. A remote cause may continue to form a part of the proximate cause: thus the splinter which I formerly mentioned may strike a man’s body, and then be still fixed in the body, so as not to be easily extracted; and so long as it continues to be an irritant, and prevents the healing of the wound, it is to be considered as a part of the proximate cause. A plethora also is commonly considered, and may be considered, as the remote cause of a hæmorrhagy that afterwards arises; but whenever that plethora continues, it is to be considered as a part of the proximate cause of such hæmorrhagy. The only good definition of a proximate cause, is that given by Boerhaave, (Institut. §. 740.) ‘Causa proxima morbi appellatur, tota illa simul quæ totum jam præsentem directe constituit; hæc semper est integra, sufficiens, præsens, totius morbi, sive simplex fuerit, sive composita. Hujus præsentia ponit, continuat morbum. Hujus absentia eum tollit. He adds, ‘Est fere eadem res ipsi integro mobo;’ and indeed this

definition of the proximate cause is scarcely to be distinguished from his definition of disease.

"It has been common to divide causes into *external* and *internal*, the last comprehending whatever has subsisted for some time before it produced its effects upon the body; the first, whatever is applied from without, and immediately operates its effects. There is often some use in this distinction of causes; but it is a great mistake to suppose that it implies the same as that between remote and proximate causes; there may be internal causes which are not proximate, and external causes which may be considered as a part of the proximate.

"Another distinction with regard to causes, viz. that into the *predisposing* and *exciting* causes, deserves attention; as, when an effect is produced by a particular agent acting upon a particular subject, which agent would not have acted upon every subject. Thus to recur to my former illustration, in order to kindle gunpowder, a spark can be produced only by the collision of two certain bodies, flint and steel. The collision of flint with soft iron will

not produce the effect, which will therefore depend upon a concurrence of causes. Now the human body is at different times in different conditions with regard to its fitness for being acted upon by particular agents; such a condition is called a predisposition, and the causes which produce it are termed predisposing causes. All those agents, on the other hand, which produce their effects only under certain conditions, are called occasional or exciting causes."

These extracts are not given with a view of proving that Dr. Cullen taught any doctrines which are new to the profession at the present day; they are inserted merely to show the philosophic principles upon which his theory and practice was founded, and the defective and mutilated form in which his works were before presented to the public. By far the greater number of paragraphs throughout the present edition, have similar additions made to them; and the profession at large is greatly indebted to Dr. Thomson for the trouble which he took to collect such valuable and interesting materials.

Medical and Philosophical Intelligence.

Acupuncture.—Dr. Elliotson gives the following brief summary of his experience in this operation. During the last three years, I have employed *acupuncture* very extensively, both in private and at St. Thomas's Hospital, in rheumatism. My experience perfectly coincides with that of Mr. Churchill,—of its being chiefly useful in the rheumatism of fleshy parts—rheumatism: and the more so, as the disease is less inflammatory. Indeed, when the parts are hot, or the pain is increased by heat, the remedy is generally useless, and cannot supply the place of antiphlogistic measures. On the same principle I have never seen it beneficial in any inflammation or inflammatory pain. Like Mr. Churchill, I find that one needle allowed to remain an hour or two in a part, is more efficient than several used but for a few minutes. The effects are often magical. The pain sometimes ceases while the needle is in the flesh, but generally three or four applications to each painful part are required. I have known the disease not entirely yield before the ninth. Of forty-two cases, taken in succession from the hospital books, thirty were cured; and the other twelve were clearly not adapted for it, as they were either accompanied or aggravated by heat, and yielded afterwards to antiphlogistic measures. It is occasionally a good mode of letting off the fluid in anasarca; but for this purpose, the needle requires to be passed nearly through the skin, and not to an inch or an inch and a-half, as in rheumatism. Neither is its use always attended with success, as in rheuma-

tism. When practised below the knees, I have heard of it producing mortification; but above them, and in the arms and trunk, it appears free from danger.—*Medico-Chirurgical Transactions.*

Carbonate of Iron in Chorea.—The chief object, observes Dr. Elliotson, of the paper upon the subcarbonate of iron,* was to show that it might be given in doses of three or four drachms, and that it was almost a specific for chorea. The former point is now considered to be established, and I have since attended nine cases of the disease, every one of which yielded to the remedy. Some like the former cases were attended with headach, some had resisted other means. The time usually required varied from six to ten weeks: one was cured in four, and one in not fewer than twelve. I could not then satisfy myself that large doses were superior to small ones in any disease, but I have now met with several instances of disease yielding at once to large doses, after resisting those in common use. Its importance, to which also, I then alluded, in many cases of chronic ulceration, has been again repeatedly proved. I have treated a genuine case of traumatic tetanus with it, in doses of half an ounce every two hours, taken diffused in treacle with beef tea, and the mitigation of the disease upon its exhibition, was too

* *Medico-Chirurgical Transactions*, Vol. XIII., part 1st, 1825.

obvious for me not to ascribe the cure to the article in question. I have always conceived that we were upon a wrong scent in our attempts to cure tetanus and hydrophobia by narcotics, and that we should employ other remedies which exert a peculiar action upon the nervous system. The full powers of iron deserve to be fairly put to the test, when its exhibition is practicable.—*Medico-Chirurg. Transactions.*

Deleterious effects from the external application of Elaterium.—M. S. Richard, has inserted in the *Journal de Chimie Médicale*, some observations on this subject, from which we extract the following: Dr. Dickson of Edinburgh, desirous of examining the flowers of the *mordica elaterium*, L., obtained a specimen from the Jardin du Roi, and in order to carry it more conveniently put it in his hat, which he replaced upon his head. He was in a state of perfect health at the time, but half an hour afterwards, was attacked with violent headach, attended with a sense of constriction across the forehead, and followed by griping pains, catharsis, and at the expiration of three hours, vomiting of the contents of the stomach and a greenish bile. These symptoms, which began to show themselves about five in the afternoon, were continued, accompanied with fever, until the following morning, when they gradually subsided.

This case is singular, inasmuch as it proves that the simple application of the fresh branches of the plant, will produce a series of phenomena, almost entirely similar to those arising from its internal administration. From the experiments of Orfila with the extract of the plant, given by the mouth, or injected into the cellular tissue, it results; 1st, that the primary effects, depend as much upon the inflammation which it excites, as upon its absorption; 2d, when death occurs, it is to be referred to the lesion of the nervous system, sympathetically affected; 3d, it exerts, moreover, a special action upon the rectum, the mucous membrane of this intestine being always found more or less reddened in animals who have died in consequence of its injection into the cellular tissue. The *Dictionnaire des Drogues*, contains two cases, analagous to that above related, in one of which *narcotisme*, attended with serious symptoms, arose from the application of powdered iris to the head; and in another, from carrying upon this part of the body, a large quantity of the *Dulcamara*, in its recent state.

Experiments on the Effects of Bryonine on the Animal System.—M. Collard de Martigny has extended to this principle the investigations of Orfila on the effects of the bryony root, and has obtained results which show that the chief properties of the root reside in the principle in question. The bryonine was first discovered by Brandes and Firnhaber; but M. Collard de Martigny has found it more easily separated by the process more lately suggest-

ed by M. Fremy, which consists in saturating the juice with ammonia, filtering the fluid, and evaporating it till a pellicle is formed on the surface. The pellicle is the impure bryonine, which is to be purified by solution in alcohol. Twenty-two grains of this killed a rabbit in ten hours when administered by the stomach, no particular symptoms intervened, and after death the stomach was found thin in some places, thick and hard in others, and its villous coat red, and interspersed with a few white granulations. Twenty grains injected into the pleura caused death in seven hours, attended with all the signs of pleurisy, namely, serous effusion, the formation of a pseudo-membrane, and gorging of the lungs. Thirty-four grains thrust under the skin of the neck and back of a dog killed it in fifty-eight hours, causing extensive inflammation and suppuration around the wound. Bryonine, therefore, is a pure irritant, which does not appear to act through absorption. It is much more powerful than the root which yields it; yet a given quantity is not so active as the quantity of the root from which it is procured. *Nouvelle Biblioth.*

Case of Ligature of the Carotid for supposed aneurism, proving fatal by laceration of the artery under the ligature. (*Nouvelle Bibliothèque Médicale.*)—The case we are now to describe occurred in the hospital practice of M. Lisfranc. A young girl had a tumour of the size of a pigeon's egg behind the right angle of the lower jaw; and as it presented to M. Lisfranc all the characters of an aneurism, he resolved to tie the common carotid. This was accordingly done, without any untoward accident happening; the ligature consisted of a single thread; and the wound was dressed so as to heal by the first intention. A few hours after the operation symptoms of inflammation of the brain arose, attended likewise with inflammatory symptoms referred to the throat and chest, but these were all subdued by the antiphlogistic treatment, and the girl on the eighth day appeared to be doing well, the tumour having diminished considerably, when, on bending the head to drink, she felt a sense of something giving way in the wound, and a profuse hæmorrhage ensued, which proved speedily fatal. On dissection it was found that the tumour was not an aneurism, but a fungous hæmatodes, of which a considerable portion occupied the middle cerebral fossa of the right side, the petrous portion of the temporal bone being mostly destroyed or converted into fungoid matter. The internal jugular vein was filled for six inches of its course with a polypus, adhering by two or three pedicles. In the carotid artery between the ligature and the heart there was a lacerated hole three lines long, partly closed by a fibrinous clot. The ventricles of the heart were much enlarged, and their parietes thinner than natural. There was in the posterior mediastinum an abscess containing a wine glassful of pus.—*Ed. Med. and Surg. Jour.*

Case of Intestinal Calculus. Communicated by Mr. Wickham.—Master W—, the son of a medical man, was attacked, in the morning of October 17th, 1826, with a severe pain in the right lumbar region, just above the crista of the ileum, for which he took four grains of calomel and a cathartic draught. The pill remained on his stomach, but the draught was soon rejected. In the course of the night, the pain became more acute, and was accompanied by continual vomiting. No evacuation could be procured till the third or fourth day; previous to which, the abdomen had become tense and painful on pressure. The pain in the original seat of attack remained unabated. I need not say that bleeding, blisters, purgatives, and glysters were, in the course of the attack, suggested and employed by Dr. Littlehales, my father, and myself. The inflammatory symptoms pursued an uninterrupted course, and terminated the existence of the poor boy on the 23d.

By desire of the father and friends, the body was inspected, and the state of parts was as follows:—The general aspect of the abdomen was such as is usual after inflammation; the situation of the viscera natural. In the neighbourhood of the cæcum, there was effused a large quantity of adhesive matter and pus; the cæcum itself and the bowels lying by the side of it, very vascular. The appendix vermiformis cæci had an ulcerated opening in it, and a calculus was on the point of making its escape into the abdomen. This concretion was about the size of a cherry-stone; another, somewhat larger, was sacculated in the appendix, nearer to the body of the gut. The calculus has somewhat the appearance and consistence of wax, though harder, similar to that which is occasionally found to pass per anum; but whether biliary or intestinal, I cannot determine.—*Lond. Med. & Phys. Jour.*

On the Predestination of the Sex; by M. Hufeland.—In a memoir printed in his Medical Journal, in 1819, M. Hufeland showed that the numerical relation of the individuals of the two sexes in man (21 : 20) is the same over the whole surface of the globe; that this relation does not depend either upon climate or planetary influences, or upon the generative act, but that the sexual difference already exists in the germ formed beforehand in the mother, and that the fecunding principle has only to give animation to it. To the recent inquiries made in France, by MM. Olivier, Prevost, Dumas, and Girou de Buzamique, and the conclusions which they have elicited, M. Hufeland opposes several objections, viz. 1st, The sexual union of a middle aged man with a younger woman, being, for very natural reasons, the most frequent of all, there ought to result a very great excess of male children, which, however, is by no means the case; 2d, In long wars, where the class of young men is nearly exhausted in a nation, a marked excess ought to manifest itself on the side of the female sex, which, however, is

never observed; 3d, The conjugal unions in which the parties are of equal age, ought to produce an equal number of male and female descendants, through the whole duration of life, which is not the case. 4th, Experience shows conjugal unions of middle aged men with young women, by which, however, there have been only female children; 5th, Even allowing all the combinations established upon the influence of the relative age of the father and mother, they are not sufficient to explain the constant relation of 21 : 20 between the sexes. The same objections may also be made to the influence attributed to the relative power of the constitution of the male and female, which has been estimated for the purpose of levelling the exceptions. With regard to experiments upon animals, it is clear that they are inapplicable to man. The numerical relation between the two sexes does not depend upon accidental circumstances, but is founded upon a superior law of nature, constant in all climates, and at every period of time, and always the same in all its relations.

Ed. New Phil. Jour.

Preparation of Sulphate of Quinia and Kinic Acid, without the use of Alcohol.—The following is the process of MM. Henry and Plisson: About two pounds of bark are to be coarsely powdered and boiled with water, acidulated with sulphuric acid in the usual manner. When the hot liquors are cleared, recently prepared and moist hydrate of lead is to be added until the fluid is neutral, and has acquired a faint yellow colour; this must be done carefully, lest too much hydrate of lead be added. As the decolouration of the decoction is necessary, the liquid, if it remains turbid until the next morning, must have a little more hydrate added and be refiltered, but the operation is rarely subject to this inconvenience, being usually finished in a few hours. The yellow liquid contains a little kinate of lead, much kinate of lime, kinate of quinia or cinchonia, a little colouring matter, and traces of other substances. The washed deposit consists of colouring matter, combined with oxide of lead, sulphate of lead, and a portion of free quinia; it contains no sub-kinate of lead.

The lead, dissolved in the fluid, is to be separated by a few drops of sulphuric acid, or a small current of sulphuretted hydrogen, and the filtered liquid is to be precipitated by adding caustic lime, previously mixed into a thin paste with water, until the earth is in very slight excess; in this manner the quinia is precipitated. The addition of sulphuric acid readily converts this quinia into sulphate, which may be obtained in very white and silky crystals. The fluid left after the separation of the quinia, contains a kinate of lime almost pure. Being evaporated until of the consistence of sirup, it readily crystallizes in a mass, which may then be purified by recrystallization. The kinate of lime may be precipitated by means of alcohol, and then be crystallized after solution in water or diluted

alcohol; or, by adding oxalic acid drop by drop, according to the directions of M. Vauquelin, the lime may be separated and kinic acid obtained. Two-thirds of the quinia or cinchonia in a specimen of bark may be thus separated, and with such facility as to offer a ready test of the presence of these alkalies in any wood or bark submitted to examination.—*Ann. de Chimie*, xxxv. 166.

New method of preparing the Ammoniuret of Silver.—To a solution of the nitrate of silver, add hydro-chloric acid till a precipitate of chloruret of silver is thrown down; wash the precipitate, till the water employed no longer produces any change in the colour of litmus paper; the chloruret thus purified, is exposed to the action of liquid ammonia, and after the solution is completed, caustic potash is gradually added; a lively effervescence immediately follows, the liquor changes at first to a brown colour, which by degrees assumes a deeper hue, and ultimately becomes entirely black; the process is completed, when a further addition of potash no longer occasions effervescence; if after the addition of a quantity of water, the solution be placed upon a filter, it will pass colourless or with a slight amber tint, leaving upon the filter a black powder, which was the cause of its colouration.

The powder retains its black colour, after having been carefully washed and dried; exposed to heat it is decomposed, and this process is accompanied with a detonation proportioned to the quantity of the powder employed; the same effect is produced by friction and percussion; it is entirely dissolved in a solution of ammonia, and resembles in every respect, the ammoniuret of silver, obtained in the usual method.—*Journal de Pharmacie*, &c.

Encephalitis caused by Electro-puncturation.—Giovanni Grassi, long subject to frequent paroxysms of vertigo, occasioned by gastro-cerebral congestions, which generally yielded without difficulty to proper evacuations, was at length attacked with apoplexy, accompanied with hemiplegia, loss of speech, respiration irregularly slow and frequent, pulse intermitting and at times scarcely perceptible, without however any indication of gastro-intestinal irritation. Under the influence of an appropriate treatment, these symptoms nearly disappeared at the expiration of a few months; the pulse became more regular, the articulation more distinct, and he had acquired some power of motion over the paralyzed members, when Dr. Strambio proposed electro-puncturation, with a view of rendering the innervation more complete, and it was accordingly performed by Dr. Fantonelli in the following manner: A needle was introduced into the inferior part of the neck on the sound side, and another into the external malleolus of the affected limb; a metallic wire, communicating with the two needles, was brought in contact with a voltaic pile of five pairs; the negative

pole corresponding with the needle in the malleolus. The introduction of the needle was not painful, but each stroke of the pile, gave rise to acute pain and violent contractions in the neighbouring muscles, especially those affected with paralysis. The pain was more intense at the negative pole, and becoming intolerable after five or six strokes, the operation was discontinued, and subsequently repeated twice, at intervals of a day. After the first experiment, the patient appeared more lively, and could move his limbs more freely than before; some slight indisposition followed the second, and a violent fever with all the indications of cerebral congestion, was the result of the third. The encephalitis yielded to vigorous depleting measures, but the patient relapsed into the state in which he was, subsequently to the apoplectic attack; his speech is almost entirely lost, and the motions of the legs extremely feeble. Arnica and the Rhus Radicans have been tried, but have proved rather injurious than beneficial.—*Giorn. crit. di Med. Analitica*, Milano.

Hypertrophy of the Brain.—A painter about 30 years of age, of an athletic form, whose reason had been somewhat impaired for several preceding months, was found motionless extended upon the ground, and carried to La Charité, where he died eight days after his admission, presenting symptoms of profound cerebral disease, with some indications of colic-pictorum, such as retraction of the abdominal muscles, constipation, &c. He had no consciousness of his words or actions, and when interrogated, his brief replies were made at random, and generally had not connexion with the question put to him. There was, moreover, insensibility of the whole body, the face alone excepted; the muscles of which could be excited to contraction, when irritated.

On dissection, the abdominal and thoracic viscera were found in a state of perfect integrity, and the brain, at first sight, presented nothing remarkable; a nearer inspection, however, readily detected the characters of a true hypertrophy; the anfractuosities were almost entirely obliterated, and the two ventricles reduced to a single cavity, scarcely capable of containing a nut; the weight and consistence of this organ was much increased; there was no effusion of serum in any part of its substance, and the ventricular parietes were in immediate contact.—*Archives Générales*, &c.

The following plan was successfully adopted by M. I. Terrier fils, in order to extract a portion of a silver catheter, which had been broken, and left in the bladder by the patient, three days before. Having ascertained the situation of the broken piece, which occupied the neck of the bladder, and about an inch of the urethra, a large silver canula was passed down until brought in contact with it, and maintained in apposition, by means of the finger introduced into the rectum. A kind of

perforator, made for the purpose, eight inches in length, gradually lessening in diameter at its inferior extremity, which was armed with a number of small points, was then introduced through the canula, and by a rotatory motion made to enter the cavity of the detached piece. The points on the extremity of the perforator served to fix it in its situation, and the whole was withdrawn together.—*Reper-
toire Général d'Anatomie, &c.*

Active alkaline principle of Conium Maculatum.—According to M. Brandes, the best method of obtaining this alcaloid, consists in digesting the fresh plant in alcohol for the space of the three or four hours, evaporating the filtered liquid, and agitating the residuum with water; this mixture is subsequently treated with alumine, magnesia or the oxide of lead, the whole evaporated to dryness, and the residuum again subjected to the action of a mixture of alcohol and ether, which is again evaporated, in order to obtain the coniin. This principle, which has been already recognized and named by M. Peschier, possesses very striking alkaline properties. According to M. Giseke, the aqueous solution forms a copious reddish precipitate, with the tincture of iodine, gives a brownish tint to the tincture of galls, precipitates the hydro-chlorate of zinc, and the sub-nitrate of mercury of a yellow colour, produces a slight cloud in the solutions of the sub-carbonates of potash and soda, gives a brown colour to a solution of the hydro-chlorate of platina, and throws down a whitish precipitate with the nitrates of silver and barytes, the acetates of barytes and lead, the hydro-chlorate and hydrate of lime.

Half a grain of this principle produced death in a dog; the symptoms resembled those following the exhibition of strychnine; upon dissection the vessels of the brain, the right auricle of the heart, the superior cava and jugular veins were found engorged with blood, while the abdominal viscera were altogether deprived of that fluid.—*Bull. Univ.*

Singular habitude of Phosphoric Acid with Albumen.—MM. Berzelius and Englehart differed in their results respecting the effect of phosphoric acid on albumen; the latter found the acid caused precipitation of the substance, the former the reverse. Fortunately coming into company, they made some experiments, and discovered a very singular property of the acid. The acid in Berzelius's laboratory not precipitating albumen, Dr. Englehart prepared a fresh portion from phosphorus and nitric acid, evaporating the solution in a platina vessel, and heating it to redness. This acid dissolved in water, precipitated both animal and vegetable albumen abundantly. Another portion of acid, prepared by burning phosphorus in air, also precipitated albumen. After many experiments to discover the cause of difference in the acids, Dr. Englehart remarked, that the two acids he had prepared, gradually

lost their power of precipitating albumen, and in some days were like the acid of Berzelius. This change took place both in open and closed vessels, and was not at all hastened by ebullition. Upon evaporating the acid, and heating it to redness, it recovered its precipitating power, but gradually lost it again by a day's repose. The cause of this difference escaped detection; it evidently does not depend upon a difference of oxidation. "May it not be supposed," says Berzelius, "that there exists a chemical combination of phosphoric acid with water, which is not formed until some time after solution, and which is incapable of precipitating albumen?"—*Annales de Chimie, xxxvi. 110.*

Sugar of Liquorice.—The following is the process adopted by M. Berzelius, for obtaining this vegetable principle in a state of purity. A warm infusion of the root of the plant is filtered, and when cooled, small quantities of sulphuric acid are added as long as any precipitate is thrown down; the latter is the principle in question, in combination with the acid. It is washed successively in acidulated, and pure cold water, and the mass afterwards treated with alcohol, in order to precipitate the vegetable albumen. To the solution thus purified, the subcarbonate of potash or soda, is added by degrees, until it no longer occasions effervescence; the solution is then evaporated to a certain extent, to occasion the precipitation of the alkaline sulphate, after which the evaporation is continued, and the sugar obtained in the form of a yellowish transparent mass, possessing the peculiar taste of the root, readily soluble in water and alcohol, and communicating a yellow colour to the solutions. Acids precipitate it from its aqueous solutions, and the precipitates thus obtained, have a sweet taste unaccompanied with acidity, are readily soluble in boiling water, and assume a gelatinous form on cooling; they are also soluble in alcohol. With the salifiable bases, this principle also forms combinations, very soluble in water, and slightly so in alcohol. With the metallic oxides it forms insoluble compounds; all these combinations are perfectly neutral.

A substance precisely analogous to the sugar of liquorice, is also obtained from the *Abrus Precatorious*. The saccharine principle of the *Polypodium Vulgare* is of a different nature; its sweet taste disappearing under the influence of reagents.—*Bull. Univ.*

Hemiplegia treated by the alcoholic extract of Nux Vomica.—Rosa Baffoc, aged 56 years, of a sanguineous temperament, had an attack of apoplexy, during parturition, fifteen years before; from which she entirely recovered, with the exception of a slight affection of her speech; in August 1824, she had another and more violent attack. The usual treatment in such cases was employed by Dr. Chiavelli, and the apoplectic symptoms gradually disappear-

ed, leaving however an incomplete paralysis of the left side; some slight motions only were performed by the leg. A variety of external means, such as blisters, frictions with tartarised antimony, stimulant embrocations, &c. was unsuccessfully employed, and Dr. C. ultimately determined to make trial of the strychnine, considered by M. Magendie as possessing an elective action over the medulla spinalis. On account of the debility and excitability of the patient, the alcoholic extract of nux vomica was preferred to the pure strychnine, and was given at first in the quantity of half a grain, gradually increased to two grains morning and evening. This remedy continued during fifteen days, excited spasmodic contractions throughout the body of the patient, and a state of general orgasm succeeded to her previous tranquil condition; she complained of a burning heat of the skin, her countenance was suffused, eye brilliant, pulse full, tense and hard. The extract was discontinued, and the morbid excitation removed by repeated venesection; still, however, she had reacquired no power of motion over her arm. She was now placed upon a simple regimen, general depletion occasionally employed, and she ultimately recovered so far as to perform some slight motions with her arm, and to be able to walk with assistance.—*Journal des Progres, &c.*

On the treatment of Amenorrhœa and Leucorrhœa. Révue Méd.—The July number of this Journal, contains two short but instructive papers on the subject of amenorrhœa, and its concomitants, particularly leucorrhœa. The author of one of them, M. Moulin, considers chiefly the form of the disease which attacks robust, plethoric females, and which is characterized by the cessation of the discharge being speedily followed by a febrile state of the pulse, and symptoms indicating a determination of blood to one or other of the great cavities, if not actual inflammation of one of the viscera. In such cases it has long been the custom to use the lancet, and M. Moulin has given some excellent examples of the efficacy of such treatment. He states, that when blood was drawn on the day before that on which the flow of the catamenia, but for the suppression, would have begun, he has found it reinstated almost invariably, and sometimes the restoration took place while the blood was flowing from the arm. When leucorrhœa accompanied such cases, it ceased at once after the bleeding, if the menstrual discharge was restored. M. Guibert, the author of the other paper, after a few observations, in which he concurs with M. Moulin, as to the advantage and peculiar effects of blood letting in the amenorrhœa of robust plethoric people, proceeds to notice the chief emmenagogues which he has found useful in the other variety, the amenorrhœa, namely, of females of a feeble, nervous, and lymphatic temperament. Of all the substances he has tried, none have appeared to him to be so steadily successful as Venice turpentine. The form in which he uses it, is that of pill com-

pounded of two parts of turpentine, three of Castile soap, and the necessary quantity of liquorice-root powder, each pill containing four grains, and ten being the daily dose. Even in inveterate cases he has seldom been obliged to continue the treatment above twelve days.—*Ed. Med. and Surg. Jour.*

Spontaneous Emphysema. (Rust's Magazin für die gesammte Heilkunde, 1826.)—A stout man, 59 years old, was attacked with cough, accompanied with acute pain in the right side, and a sensation there as if something was forced outwards at each cough. He did not apply for medical advice, however, till he remarked a tumour in the seat of the pain. When he was first visited by his physician, the pain was felt on a small spot between the seventh and eighth ribs of the right side, a few inches from the spine; the whole breast and side of the chest were much swollen, the swelling being evidently emphysematous, and when the tumour was pressed down with the finger, over the seat of the pain, it was at once restored with the next fit of coughing. The emphysema gradually extended day after day, till the whole trunk and head, both arms, and even the right thigh, were affected. As suffocation seemed then to threaten the patient's life, incisions were made in various parts, and air escaped from the apertures when the body was moved, or when pressure was made around them. On the back, where the swelling was greatest, incisions could be made an inch and a half in depth without coming in contact with the muscles. The difficulty of breathing was thus removed; but the disease continued some weeks longer, till at length, an incision was made near the spot where it was presumed the air escaped from the chest. Inflammation of the part was thus induced, terminating in induration of the cellular tissue and closure of the opening.—*Ed. Med. and Surg. Jour.*

On the relative Proportions of certain parts of the Eye of the Fœtus, compared with the same parts of the perfectly developed Eye. By Professor Carus.—The remark has already been made by some anatomists and physiologists, that the human eye, as well as all the organs, runs through a series of degrees of development, in which its analogy with the eye of animals is so much the greater, the nearer it is to its first formation. The object of Professor Carus, in his memoir, is to follow out this proposition in some of its details. The following are among the most interesting results of his investigation.

The eye of man, compared with that of animals, presents the most extended retina, in proportion so the size of the eye-ball (consult Soemmering's Plates, *De Oculorum hominis animaliumque sectione horizontali*, Gotting. 1818.) The vitreous body of the human eye is the largest of all, compared with the bulk of the crystalline humour: the portion of the eye-ball which

covers the transparent cornea, and which allows the iris and pupil to appear, is smaller in proportion to the part which the sclerotic covers; and this proportion is modified only in birds, especially the birds of prey, in which the extraordinary breadth of the ciliary processes puts limits to the extension of the retina, which is kept at a distance from the edge of the cornea. In the eye of animals, also, the sclerotic scarcely appears under the palpebræ, while a considerable portion of it is visible in the human eye.

It is equally observed, in the different forms of the latter, that the relation of the extent of the iris and pupil, to the surface of the visible portion of the sclerotic, is not always the same. In children, the iris and pupil have a greater proportional extent, exhibiting an analogy with the eye of animals; and in adults a larger iris with its pupil, seems to us rather to be the expression of physical power, while an eye in which the contrary takes place, and in which the sclerotic coat shows itself to a great extent, expresses rather something spiritual or celestial. The pious painters of the old Italian and German schools had a clear idea of this proportion, and in their representations of eyes of virgins, angels, Christ, and saints, it may be seen that the pupil and iris are smaller in relation to the sclerotic, than they are in well formed ordinary eyes. From this it may be presumed, that the eye of the fœtus will equally present modifications in the proportion of the parts of which it is composed. The results which M. Carus has obtained, in consequence of accurate measurements, are the following: That the proportion of the breadth of the iris to that of the globe of the eye, as well as that of the iris to the axis of the eye-ball, increases with age; that the eye of the fœtus only assumes by degrees the proportions that obtain in the eye of the adult; and that the smallness of the iris, in proportion to the diameter as well as to the axis of the ball of the eye, is one of the characters by which the fully developed human eye is distinguished, both from the eye of the fœtus and from that of animals.—*Ed. New Philosoph. Journal.*

Monopodia.—M. Cruveilhier recently presented to the *Société Anatomique*, a fœtus, the two inferior extremities of which were united throughout the greater part of their extent. The two femurs were blended together in their superior third, and separated below; the legs, united throughout, were composed of three bones; the one in the middle, represented the fibulæ consolidated into one, the tibiæ being situated externally. The feet, connected by their external margins, formed also a single member, with nine toes, the plantal surface being situated superiorly, and the dorsal below. The middle toe was formed by the junction of the two little ones. The os bones calcis, the curboides, and the fifth metatarsal, were likewise soldered together. The pubes were completely ankylosed upon the median line, presenting a crest, projecting posteriorly; their posterior face was

directed upwards, and supported upon its concave surface a pouch filled with fluid. The two ischia, united in their ascending branches, formed a middle crest, with only one tuberosity, obliterating almost entirely the inferior outlet; the obliteration was rendered complete by a vast cotyloid cavity.—*Journal des Progres, &c.*

Rupture of the Heart.—A poor man, aged 70 years, according to the account given by his friends, had always enjoyed good health, until about four or five days preceding his death, which happened suddenly, when apparently convalescent, some fifteen minutes after having made a copious repast. On examination the cartilages of the ribs were ossified to such a degree, that they could with difficulty be divided with a strong knife; the pericardium was filled with blood, which had also escaped by an opening, made probably by the knife, into the cavity of the thorax; a large rent was found on the anterior surface of the left ventricle, surrounded by several small ulcerations, which appeared to have arisen from ulceration of the substance of the heart; there was neither in this organ, nor in the aorta, any impediment, or malformation which afforded any explanation of the rupture.

A whitish mass, five inches in diameter, partly ossified and partly membranous exteriorly, was found adhering to the anterior surface of the liver, and containing a limpid serum, with several hydatids of various sizes. The stomach was unduly distended by a large quantity of aliment, the immediate cause, probably, of the rupture.—*Journal des Progres, &c.*

Mutual Action of Lime and Litharge.—M. Fournet heated a mixture consisting of 7.12 parts of calcined lime, and 27.89 parts of litharge, very strongly; a coherent mass was obtained, which, pulverized and digested in water, gave, when filtered, a perfectly clear and colourless liquor, which, when treated with sulphuretted hydrogen, threw down an abundant black precipitate: hence oxide of lead is rendered soluble in water by means of lime.—*Ann. des Mines, i. 538.*

Accouchement after death, and absence of the Pericardium.—A case of this kind is related in Rust's Magazine by Dr. Wolf, as having occurred in a woman 42 years of age; the child was expelled the day following her death; the heart was found floating loosely, without its pericardium, in the left thoracic cavity. This fact evidently proves, if indeed further proof were necessary, that the different organs successively lose their vitality, and that in this instance the uterus was the *ultimum moriens*. In relation to the absence of the pericardium, this is a possible occurrence, notwithstanding the assertion of Haller and Morgagni,—in such cases, its office is supplied by the pleura. An instance in which this membrane was wanting, is related in the *Bul-*

letín des Sciences, Médicales, Tom. x. art. 6. 1827.—*Bull. Univ.*

Ossification of the Tunica Vaginalis.—M. Yvan presented to the Académie Royale, the tunicae vaginales taken from an old man, eighty three years of age, in a state of ossification. The enclosed testicles were sound, and surrounded by a minute quantity of serum. M. J. Cloquet has seen with Beclard, two similar cases; and M. Amussat has extirpated a carcinomatous testicle, which was scattered over with osseous points.—*Archives Générales, &c.*

M. Lisfranc announces that he has recently performed four new amputations of the neck of the uterus, and adds that this operation is much less painful than one would, a priori, be inclined to suppose.—*Revue Médicale.*

Distribution of Nerves in Muscular Fibres.—In a memoir on muscular action, MM. Dumas and Prevost have communicated some very interesting microscopical observations on the distribution of the nerves in the muscular fibres, and on the forms which these latter assume during their contractions. They placed a thin piece of muscle, retaining its nerves, under the microscope, and made it contract by means of galvanism. The fibres contracted by bending in a zigzag manner, and the last nervous filaments were seen to proceed parallel to each other from the branch giving origin to them, to be inserted precisely at the points where the fibres form their angles.

Commentatio Chirurgica sistens extirpationes steatomatis in Pelvis cavitate radicans; auct. G. F. Kohlrusch. The tumour, the removal of which, forms the subject of this interesting dissertation, weighed eighteen pounds and a half; its attachments extended into the pelvis, as far as the sacro-sciatic ligaments, sacro-iliac articulation and rectum. The enormous wound resulting from the operation cicatrized without difficulty, and the patient was discharged cured, at the expiration of four months and a half.—*Bull. Univ.*

Largest known masses of Native Platina.—Before Humboldt's return from America, small grains only of platina were known to naturalists. On his arrival in Prussia, he deposited in the Berlin Museum a native specimen of Peruvian platina, weighing 1083 grains. For 20 years, this remained the largest specimen in Europe. Since 1822, the Museum of Madrid has been enriched with another American mass of platina, weighing 11,641 grains. A few months ago, a still more remarkable mass was discovered in the Urals, weighing $10\frac{5}{9}$ Russian pounds. It is deposited in the Museum of St. Petersburg. The relative weights of

the platina of Berlin, Madrid and Petersburg, are as 1, 11, 75.

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